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General Articles

ACCIDENTS AND INJURIES TO THE RACING GREYHOUND*

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The surgery of the greyhound is specialised, as the animal is used for a specific purpose. For several reasons many of the conditions met in a canine practice are non-existent; *e.g.*, the greyhound is kept under observation and carefully fed, therefore the risk of foreign bodies in the alimentary tract is negligible. Again, his period of training and active service is a comparatively short one, thus tumours, *e.g.*, adenoma, and dental conditions, are rare. Owing to the nature of his work, however, and the pitch of condition to which he is trained, the greyhound is subject to accidents which could not happen to the ordinary dog. I propose to discuss some accidents and injuries I have met and also the lines of treatment I have adopted in my endeavour to keep the dog fit for racing and extend his period of work, always bearing in mind that temporary or partial cures are almost useless. I think it is best to deal with the surgery of the greyhound as (*a*) regarding limbs and lameness, (*b*) other surgical conditions. I should like first to dispose of the latter as they are comparatively straightforward.

Wounds

Wounds are common, due to fighting or accidents. They may be superficial, affecting skin, or deep into muscle or tendon.

(*a*) SKIN.—These I treat in the usual antiseptic manner, *i.e.*, cleaning hair from the edges, swabbing out with hydrogen peroxide and applying acriflavine, 1 : 1,000 aqueous solution. When the wound is fairly clean and likely to heal by first intention and suturing is indicated, I use twisted silk which is kept in spirit; in an emergency it may be drawn through an iodine swab. If there are flaps, or the wound gapes and is not likely to heal by first intention, I use, in preference to dressings, "Michel Clips." They have the advantage of being easily applied, removed, and refixed is desired. If it is a puncture wound I flush out with an "all-glass" ear syringe which is readily sterilised and kept clean, using H_2O_2. When granulation has started, I apply glycerine to the wound. I tried a mixture of acriflavine with glycerine but these agents appeared to be antagonistic, as healing was delayed.

(*b*) MUSCLE.—There is generally much bruising when the injury has been sufficiently severe to cause an actual wound of the muscle, and in the first stages I insist on copious bathing with clean, hot saline. Any bleeding vessels are picked up and ligatured with catgut. After I am satisfied that the wound is thoroughly cleaned, if necessary I suture the muscle with No. 2 catgut or may clip or sew the skin, leaving a small distal drainage opening. If the tissues have been infected, syringe frequently with warm solution of H_2O_2 and acriflavine.

(*c*) TENDONS.—I personally have never found a severed tendon in a greyhound. Although recently one dog seized another by the Achilles tendon and almost chewed it through, with the application of kaolin poultice for a few days, followed by antiseptic dressings, a strong cicatrix formed, and the dog repeated its old times.

(*d*) TRACHEA.—I always keep at hand a small human tracheal tube as it is sometimes necessary to insert one if there has been an injury to the wind-pipe. My tube has not yet been in a greyhound.

(*e*) TAIL.—It is not rare to find a fracture of the coccygeal vertebræ and a bleeding tip is comparatively common, due, as a rule, to the high spirits of the dog and the lack of covering on the tail. These cases I dress with Friar's balsam and fix zinc oxide adhesive tape for three days. If a compound fracture be present near the distal end of the tail, I amputate the lower part, suture over the skin and carry out the usual treatment. Should such a fracture be higher up I endeavour to get healing of the wound by a gauze dressing saturated with either 0·1 per cent. aqueous solution of brilliant green and acriflavine or gentian violet or methylene blue—1 : 1,000. After healing I treat as a simple fracture and bandage the tail lightly but firmly from about three inches above the fracture to the distal end of tail. This bandage I cover with a heavy adhesive tape (1-in.) and mould the tail daily. I keep this

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fixed for about two weeks and have had good results.

There is no doubt that the greyhound uses his tail when galloping and it is a definite advantage especially in bad going or in the coursing field. If necessary, however, I would not hesitate to amputate at any site. I have seen greyhounds with two-thirds of the tail removed and they had adapted themselves to track racing and had nothing to learn in negotiating bends.

(*f*) Contusion of Muscles.—These are not rare and vary in severity. If the injury is fairly superficial the part is exposed to radiant heat for ten to 15 minutes once or twice daily, followed by massage. If deep or involving rupture of the muscle sheath, I use infra-red rays, and iodine ointment is rubbed into the warmed muscle. The results are good and a permanent cure is effected.

(*g*) Sternum.—We have, at the moment, a greyhound with an old-standing injury to the sternum—there was a slight thickening of the cariniform cartilage. He walked sound and galloped well for about 400 yards, when he generally then felt discomfort, and faded. It probably affected him when his breathing became laboured. He was then lame for about 36 hours and had definite pain on palpation of the pectoral region. His gait gradually became normal again. X-ray examination showed nothing definite beyond a slight enlargement. His trainer continued radiant heat with massage of the region, and exercise. The dog is now finishing better and has recently won races.

(*h*) Head and Neck.—Serious injuries of the head and neck are surprisingly rare when we consider the speed attained and the mechanical contrivances on a track. One sees occasional ophthalmic conditions, such as corneal opacities and ulcers, with the more serious rupture of the lens ligament, due to a sudden bump. Faulty development of the ligament appears to be a predisposing cause, as often both lenses go, if not at once, with independent shocks.

A year ago a champion hurdler, during training, struck a jump and dislocated the second cervical vertebra; this was demonstrated by X-ray examination. When picked up he showed a slight sensation in his toes; otherwise he was powerless, except in the head. Under a general anæsthetic the displacement was reduced, and a light plaster cast fitted to the neck for ten days when he was able to stand with support. In a month he was walking about with a staggering gait. In three months there was a definite hackney action in front and a slight weakness behind. This persisted for nine months and although he was able to run in the paddock, he was unfortunately unable to do track work. His owner proposed using him for stud.

Although it was not due to an injury, I should like to comment on an interesting case of apparent paralysis (of the mandibular branch) of the fifth cranial nerve. This dog showed all the usual symptoms of a catarrhal chill for about ten days. He was convalescing when it was noticed he could not completely close his lower jaw. This lack of power got progressively worse until his mouth was about two inches open. It was necessary to place a rubber band round his face to close the lower jaw for the act of swallowing. Arsenic, nux vomica and iodide tonics were prescribed, and massage of the muscles of mastication. After three weeks a slight improvement was noticed; this continued and there was complete recovery in another fortnight.

(*i*) Ribs.—It is a testimony to the fitness of greyhounds that broken ribs are not more common. Occasionally one or two ribs are found to be fractured following a crash, but fortunately I have never had any real displacement, and treatment has been straightforward and successful, although prolonged.

(*j*) Cramp.—I should like here to mention cramp, usually affecting the lumbar and/or the gluteal muscles. It may occur in a dog which has been over-worked and is due for a rest, but it generally affects a greyhound which is out of training and has recently returned to racing. If the heart is sound, I generally treat this condition by taking the dog off the racing strength for three weeks. I prescribe hard walking, no galloping, ultra-violet rays for ten to 15 minutes daily, followed by massage. Glucose D is given in his food.

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The Limbs

I wish now to deal in a systematic manner with the limbs and the most common conditions affecting their soundness.

Scapula.—I personally have not seen an injury of this bone, but I have found a rupture of the teres major muscle. There was no pain and the dog galloped sound. The swelling gradually disappeared with the application of infra-red rays and massage with iodine ointment.

Shoulder Joint.—I have been told that dislocation of this joint is not rare but I have not seen one at Powderhall. Contusions of this articulation are, however, fairly common, especially during hurdling races following faulty jumps or when the ground is rough. A bump at a bend may cause a severe strain, which is so painful that it is necessary to X-ray the joint before making a definite diagnosis. This type of injury I treat with radiant heat and rest, followed usually in several weeks by gentle exercise and massage.

Some greyhounds, after resting or convales-

cing, have returned to training but were quite unable to get round the bends at any speed, apparently due to a contraction of the shoulder muscles, popularly called "shoulder bound." This condition has responded to massage or electrical stimulation but it has taken as long as three months in some cases and even then, although the dog is apparently running freely, he is still quite unable to hug the rails as he did before his illness.

Humerus.—I have not had any interesting injury of this bone in the greyhound.

Elbow.—Bites are not uncommon at this site and there is invariably contusion. There may even be a definite arthritis but with fomentations and heat it ultimately clears away.

Radial Paralysis.—A note on apparent radial paralysis in the greyhound. The injury to the nerve happened during a race and on the following morning the dog had a definite "dropped elbow" and was unable to put any weight on the leg. There was acute pain on lateral extension. After a week, however, this pain gradually disappeared. He was massaged and rested for five months but the improvement was very gradual. During the sixth month he was gently walked and his gait became almost normal. After another month he was walking sound and was moved from the kennels; the prognosis was good.

Radius-Ulna.—I have seen a few cases of double compound fractures, all due to faulty jumps at the hurdle. I am sorry to say that I have not had good results—this being due, I think, to the length of bone, the tension of the muscles and tendons, the compound nature of the fracture, and the lack of covering which prevents sloughing when the leg is put in plaster. Deep anæsthesia and much force are required (to reduce over-riding after the wound has healed). The leg is then put in a plaster cast after being well dusted with dry boracic powder, and encased in stockinette. Although the dogs ran fairly sound I was not satisfied with the results, as they insisted on using their legs and prevented a straight union, causing the anterior face to be concave. One case I opened down over the site of the fracture, and drove an ivory peg into the medulla of each end of the radius. This was put into plaster, and although the finished result looked good, the greyhound would not walk soundly.

I make my casts with Cellona bandages, which have the advantage of being very light and drying immediately. After the bandage is hard, I cut it down both sides, to allow of inspection at frequent intervals.

Carpus.—In the greyhound I have not yet met with a fracture or dislocation of any of the bones involving this joint, but have seen several cases of arthritis. These have all responded to radiant heat and massage. If the pain is acute they are dressed with hot antiphlogistine in the intervals.

Metacarpals.—I do not think it is common to get a fracture of these bones in the greyhound unless the dog has a friable bone. I have, however, not infrequently had a bursitis at the distal end of the metacarpal bones. This has responded to painting with tincture of iodine for four days followed by radiant heat and massage with iodine ointment. At this site I have also found strained flexor tendons, which have required long rest, radiant heat and massage.

Digits.—The toes, both fore and hind, are, owing to the violent percussion with the ground, more prone to injury than any other part of the racing greyhound. The result may be an arthritis, dislocation or fracture.

(*a*) *Arthritis.*—Thickening may be found of any articulation of any toe, but the most common is that of the first and second phalanges. This condition is popularly referred to as a "knocked-up toe." After the pain of the original injury has passed off the dog may or may not walk lame. There may be pain on palpation but on manipulation it is invariably sore. Movement of the joint is restricted and the dog naturally fails to gallop freely. Radiographs of the articular surfaces, and their apposition, appear normal. On incision I have found in these toes a definite thickening of the fibrous layer of the joint capsule and it appears to be due to this that the movement is interfered with. Of course, each case must be treated individually, but it is essential that rest is prescribed. In certain mild cases I use radiant heat followed by massage with iodine ointment, which has been sufficient to effect a cure. In more acute cases, after the original inflammation has gone, I have clipped the hair and applied a liquid blister as a counter-irritant. Some of these toes have stood up to racing; others, if the going has been hard or rough, have again given trouble, and I use a thermocautery. The toes which I have fired respond well, but it is advisable to rest them for at least a month. The thickening decreases and the results are good; some have been injured again and have had to be removed.

I am using an electric cautery with platinum point and have found it most satisfactory as I get a constant heat without noise or trouble, making it possible to work with the aid of cocaine solution. First of all I make three or four punctures across the joint, penetrating as deep as the fibrous joint capsule. I then make three, two and one punctures on either side of my primary line. In one case I found it necessary to apply blister ten days after firing, as there was insufficient reaction to the cautery. Previously, when there was a definite stiffness, and persistent lameness, I amputated the lower

phalanges. This line of treatment, probably, gives the quickest and most constant results as the dog is fit for racing in about a month. It has, however, the obvious disadvantage that if he "knocks up" or fractures any other toes of the same foot at a later date, the prognosis is difficult. The results otherwise have been good and the dog runs true to time, unless, of course, going is very hard and rough.

(*b*) *Dislocation.*—When there is a definite dislocation of a digit and the collateral ligaments are still intact, immediate reduction, followed by hot and cold swabs and light dressings for protection, is the rule. If the dog is rested for two weeks the results have been good. If, however, a ligament has been ruptured, rest and allied treatment have been unsatisfactory as the joint thickens and the dog is liable to spring the toe again when galloped. In these cases I amputate at the dislocation. In a case of ruptured medial collateral ligament I drilled both phalanges adjacent to the joint and wired them together. This, however, was not a success as the dog would not gallop sound and it was ultimately necessary to remove the digit.

(*c*) *Fractures.*—Any of the phalanges may be broken. The amount of tension and force present when the greyhound is galloping can be imagined when it is found that a small, strong bone like the second phalanx has been splintered into nine pieces. It is sometimes difficult on palpation to discriminate between a fracture and a dislocation of the digit as there is definite crepitus in both conditions. I therefore make a routine X-ray examination of all injured toes. If I find the third phalanx fractured I remove it, if the second or first, I remove the second and third (and possibly part of first) and the fibrous tissue formed acts as a cushion for the first phalanx. When removing the bones I clip the hair, fix a sterile operation cloth, sterilise the skin with brilliant green and acriflavine, 1 : 1,000 in spirit, and make a longitudinal incision in the mid-line extending from above the joint to be separated, to the base of the nail, which I cut round. I then, with a pointed scalpel, sever the extensor tendon from the third phalanx, the dorsal ligaments, the collateral ligaments and joint capsule and lift the bone at the proximal end, separate the phalanx from below, leave the cartilaginous sesamoid and remove the bone or bones and claw. I insert two deep stitches through the tendon and subcutaneous tissue and close the wound with interrupted skin sutures. The most distal suture I take through the anterior edge of the pad and elevate it slightly, swab the wound with iodine and dress with dry boracic powder, and bandage the whole foot. I re-dress on the second day and apply glycerine daily until healed. This operation I perform with a local anæsthetic injection over the nerves on either side of the digit above the site, and adjacent to the pad medially and laterally. I allow the primary inflammation to abate before interfering.

It takes about one week for the skin to heal and another fortnight for the false toe to fill the fibrous tissues till it is the size of the original. I then walk the dog for two weeks in preparation for a trial. He usually finishes lame for two to three races, then settles down and runs to the old time. In the case of a chronic arthritis with an ankylosis of a toe joint the dog runs faster after amputation.

Broken Nails.—Curiously enough, broken nails are not more frequent than broken toes, excepting the clew claw which is easily torn. If the claw is torn I consider it better to remove it with bone forceps. If it is broken deep at the base it may be necessary to remove the claw from the coronary band.

There are the usual cuts and bruises to the pads, toes and webs. Those are treated in an antiseptic manner. I should like to refer to the interesting cases of perpendicular wounds, about three-quarters of an inch long, on the inner aspect of the inside fore toe over the first and second phalangeal articulation. The condition appears to be caused by the inner claws of the other foot striking and cutting the skin. Generally the internal collateral ligament is injured and often the joint capsule is also cut. If this is the case amputation is the only satisfactory cure as the healed skin cannot stand the strain and is torn open during every race. Before operating, however, it is wise to allow healing to take place and to shorten the offending nail of the other foot and then re-race again as the cicatrix may hold if the injury has not been deeper than the skin.

Pelvis.—As the result of street accidents I treat many fractures of the pelvis and dislocations of the femur, but never in the greyhound.

Femur.—I should like to record a treatment of a fracture of the shaft of the femur, at the union of the middle and distal third. With the aid of a general anæsthetic I reduced the over-riding and fitted a "Thomas" splint. This splint was kept in position, as well as possible, for about ten days. The struts were adjustable, but I found difficulty in keeping sufficient tension on the leg as it was impossible to keep the dog's foot in the boot to which the splint was attached. After ten days, with morphia and ether, we cut down on the femur and inserted a sterile ivory peg into the medulla of the shaft and placed the ends in apposition. The severed muscles were well stitched with strong black milliner's thread prepared with Harvey's wax and sterilised in the autoclave. I should like to point out two difficulties I encountered when I first operated to peg and wire a frac-

tured bone. I made too small an incision and had difficulty in manipulating the fractured ends and, secondly, I drilled the holes for wiring from the lateral side inwards and found I had great difficulty in threading the wire through. I now drill from before-back. The dog was kept under morphia for three days and the wound dressed with a 0·1 per cent. solution of gentian violet. The wound was completely healed in about 14 days but there was a definite atrophy of all the surrounding muscles. Those were massaged for another three weeks and the dog encouraged to move about. However, he would not try to use the leg and suffered from general depression. He was therefore destroyed as he was useless for racing purposes. In all bone diseases and operations I supplement the diet with vitamin D and calcium.

Stifle.—At the track I have not seen a dislocation or a fracture involving the stifle joint. I have, however, seen much contusion at this site but it has responded to fomentations and bathing.

Track Leg.—I should like at this stage to mention the so-called "track leg" which appears, as you know, on the medial aspect of the near hind leg, a short distance above the hock. It is not an uncommon condition in the track greyhound. There are several different types but usually, in my opinion, it is a hæmatoma due to a rupture of a muscular branch (or branches) of the saphenous artery. In the first stages it is generally painful and I prescribe hot water bathing and painting with iodine and the dog does not run. When there is no pain I allow the dog to run if he walks sound. If there is still œdema bathing is continued. In the case where the fluid is not absorbed in three or four days I incise the skin and fascia and express the fluid. It is necessary to make the fascia incision as long as that in the skin. When there is fluid present with no pain the dog runs very well and is capable of repeating his best time. After the race the swelling has all gone, but generally recurs in the morning and persists for a few days. When there is definite painful contusion of the bone the dog is unfit for work for several days. The condition is not a serious one and although it may recur, it does not cause any permanent injury.

Hocks.—We now come to the hock, which is frequently injured. I wish to show you radiographs of a fracture of the body of the calcaneus due to the strain and tension caused by galloping round the bends during a trial. In this particular case the scaphoid was also injured. In the first stages the leg was bathed and bandaged to reduce inflammation. Ten days after, under a general anæsthetic, the Tuber Calcis was exposed and the displacement reduced. A hole was drilled down the shaft into the body of the calcaneus and a sterile ivory peg driven down into the body of the bone. This was reinforced with silver wire through the fracture and tied. The wound was sutured and dressed with a 0·1 per cent. solution of gentian violet and the dog was rested for ten days until the wound healed. He was then encouraged to walk, but after eight weeks he would not try to use the leg and was destroyed.

I think this is the only possible treatment of a fractured calcaneus.

Scaphoid.—It is not rare to find this bone fractured during galloping. When the medial enlargement is found on X-ray examination to be scaphoid I bandage lightly for two to three days till the first inflammation subsides. After ten days, daily extension and firm massage for four to six weeks is practised. The dog is allowed to walk and he gradually uses the injured leg.

We have now running several dogs which have had broken hocks. For the first few races after treatment they generally finish lame but ultimately run as fast as before the accidents.

The metatarsal and hind pedal bones are fractured and dislocated as in the fore. We have in training a greyhound bitch which has fractured three metacarpals, a second phalanx and two metatarsals. She is running as well as ever, but appears to have brittle bones and I never feel happy when she is on the track.

Two years ago the Greyhound Racing Association took over the management of their Edinburgh Kennels and the greyhounds are kept at Dalkeith Palace Stables and fed and trained by the Company. I am pleased to say that the condition of the dogs improved, and their performances proportionally. As a matter of fact, the general rule is that the dogs are a second faster over 500 yards. Outbreaks of disease are rare—it is not common to have a sick dog—and a broken leg or toe is becoming uncommon. Actually we have had one fracture (a broken toe) during the last three months. My explanation of this is that we have been lucky enough to be free from accidents, and that the dogs are not galloped until we are sure they are fit. I found that 75 per cent. of fractures and knocked up toes occurred during the first two weeks of training. In many new dogs there was a definite lack of tone and the ligaments and bones could not stand the strain of fast cornering. It is now compulsory for all incoming greyhounds to be isolated for at least a week, when they are kept under observation and walked by a special lad. If they are free from disease, I then pass them out to their trainer. He trains the dog for another week before it is allowed to go for the necessary three trials. The dog is therefore actually in training at least three weeks before it appears in a race.

I will now show you a series of radiographs illustrating typical body injuries and fractures and the results obtained after treatment.

Discussion

Mr. H. W. Griffiths open a discussion, which was limited owing to the lateness of the hour. He said detail in the examination of a greyhound was essential, when one considered that in normal circumstances greyhounds were consistent performers, and if they varied their time over 500 yards by anything over half a second, it was probable that the veterinary surgeon would be called in to make an examination. Half a second might not seem much, but it represented roughly six lengths, and track proprietors required an explanation in the interests of their patrons, or the losing punter might cause trouble. He believed the majority of injuries were confined to the digits, and the most serious were those which Mr. Cameron had discussed—sprains, partial ruptures, dislocations and fractures—involving the articular areas. Although this was a spot that could be easily palpated, it was sometimes very difficult to give a correct diagnosis. Nor was there any hard and fast rule as to procedure. The conformation of the foot was not too strong, and looking at the radiographs Mr. Cameron had shown, the difference was very marked. With regard to minor injuries, the idea was that mobilisation of the joints was an essential part of early treatment, even if other methods had subsequently to be employed. The joint was a simple articulation and the range of movement could easily be established by the corresponding digit on the other foot. He believed the thermo-cautery was an excellent method of treatment, but he never used as many sites of puncture as Mr. Cameron suggested, and he usually recommended four to six weeks' rest. With regard to amputation, he thought there was little to be said between either the circular method or the flap method, but the flap method probably left the better after-appearance. The site for amputation must depend on the conformation of the foot. With regard to track leg, he thought it was due to violent exercise, causing rupture or laceration of the muscles. The procedure in every case was as Mr. Cameron had described, the incision allowing complete drainage. When considering irregularity in the running of dogs, one must pay attention to the muscular condition of the animals. Mention had been made of cramp. Immediately after racing, one saw a variety of conditions, and acute muscular spasm was perhaps the most common. The condition might be just transient or of longer duration, and it was possible to see the effect of acute muscular spasm in the running of a dog. These different conditions after racing might easily affect the form when the dog next ran. It was this fact that made a veterinary examination important, so as to remove any suspicion which the public might have that the dog had been interfered with. He supposed that lack of time prevented Mr. Cameron from mentioning hæmorrhagic enteritis. He (Mr. Griffiths) would have said at one time that this was a disease exclusively confined to racing greyhounds, but unfortunately he had recently seen the disease in other breeds. At the same time, it was a disease peculiar to the racing greyhound. He had come to the conclusion that the exciting cause was dietary. The dog "wolfed" a great quantity of food without mastication, unmixed with saliva, and it reached the small bowel as a fermenting mass. This improperly digested food produced toxins, and although these toxins might not be the direct cause of the trouble, they could so affect the intestinal canal that organisms might do the rest. In a few hours, a dog previously healthy might be in a state of coma, followed by collapse and death, and the *post-mortem* lesions were as inconsistent with the symptoms as could be imagined. The treatment, too, was unsatisfactory. Unless something was done at once, the patient died from collapse, and indeed in many cases treatment was of no avail. He regretted that lack of time had prevented a lengthy discussion of the paper and he would wish to express his thanks to the essayist for the number of interesting points which had been brought forward.

Mr. Chambers, after complimenting Mr. Cameron on his very able paper, said there was nothing he could offer in the way of criticism, because he agreed with practically everything he had said.

Mr. Over said the same, but Mr. Brooke, referring to a remark by Mr. Griffiths, questioned whether the absence of saliva in the case of starchy foods, was a matter of moment.

Mr. Cameron, in reply, observed he had purposely omitted any reference to the medical side of the subject and that was why he had not mentioned hæmorrhagic enteritis. With regard to track leg, in spite of what Mr. Griffiths had said, he still adhered to the theory he had already advanced.

EQUINE AND FELINE INFLUENZA OUTBREAKS

Owing to an outbreak of influenza among the horses of the Seventh Hussars at Hounslow Cavalry Barracks, all horses there have been placed in quarantine. It was stated that the epidemic had spread to the stables of many commercial concerns. During the last few weeks over 500 cases of influenza have been reported among horses in North London.

A severe epidemic of gastric influenza among cats, with a mortality estimated at 80 per cent., is widespread in the country at the present time.

COCCIDIOSIS OF FOWLS

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Coccidiosis is an infectious disease occurring not only in poultry and game birds, but also in rabbits, dogs, sheep, goats and pigs. Great economic loss is suffered by the poultryman when this disease becomes rampant in his flocks, for it is one of the most dangerous menaces to the raising of poultry. The loss is not due alone to the heavy mortality which occurs, although 25 to 50 per cent. of the birds may die, and sometimes even 100 per cent., but also to the fact that many of the birds remain stunted, under-sized and badly feathered. Moreover, there is a marked decrease in egg production amongst birds which have been severely affected with the disease.

The causative agent of coccidiosis is a protozoon (one-celled) parasite called a coccidium. The coccidia which occur in chickens belong to the genus Eimeria and consist of six known species or types, each of which attacks a different portion of the intestinal tract, some with very serious results, others only with mild effect.

Life Cycle

A coccidium has a complicated life history in that the organism passes through a series of changes which take place both inside and outside of the body of the host (in this case a chicken). The series of changes forms a complete cycle.

Coccidia are eliminated from the body of the host with the droppings and are in the form of oöcysts, which are small egg-shaped bodies, invisible to the naked eye. Each oöcyst consists of a minute mass of protoplasm containing a nucleus, and is surrounded and protected by a resistant cell wall. Outside the body of the host and under favourable conditions of warmth, moisture, and air, the oöcyst undergoes development. The nucleus divides into two and each part divides again. The protoplasm forms about these nuclei and thus four sporoblasts are produced. Each sporoblast elongates somewhat and becomes surrounded by a wall or sporocyst and is known as a spore. Each oöcyst thus produces four spores. The nucleus and cytoplasm within each spore divide and the spore soon contains two slender bodies known as sporozoites together with a small granular structure composed of unused materials and known as the residual body.

A new host becomes infected by ingesting the sporulated oöcyst with its food or drink. In the intestinal tract of the host, through the action of intestinal juices, the sporozoites escape from the oöcyst. The sporozoites are motile and they penetrate the lining of the intestinal tract. Here they become round, grow, and develop into bodies known as schizonts, which divide within themselves to form a number of small, curved or banana-shaped bodies, the merozoites.

The process of merozoite formation is known as schizogony or asexual reproduction. Merozoites are motile and they attack the epithelium of the intestinal tract, where they develop into schizonts again, which again produce merozoites. The formation of merozoites is repeated several times and thus the intestinal tract becomes heavily infested with the parasite. Finally the merozoites differentiate, some developing into macrogametocytes (female mother cells) and other into microgametocytes (male mother cells). The latter undergo development and produce a large number of free-swimming microgametes (male elements), each provided with two flagella (thin whip-like structures). Each female mother cell also undergoes development. A wall forms about it and this cell (female element) is now known as an oöcyst; there is a small opening in the wall which is known as the micropyle. The oöcyst leaves the host cell (body cell which has harboured it) and the microgamete (male element) enters the female cell or oöcyst by means of the micropyle. The nuclei of the male and female gametes unite, the cell wall becomes thicker, and a zygote or fertilised oöcyst is formed.

The process of zygote formation by means of the union of male and female elements is known as gametogony or sexual development.

The fertilised oöcyst passes from the body of the host in the fæces and the life cycle is complete. Given favourable conditions of oxygen, moisture and temperature, the fertilised oöcyst will develop, form spores, and upon being ingested by the same or another fowl will undergo again a similar cycle of development to that just described.

Symptoms

Coccidiosis may be regarded as occurring in two forms, acute and chronic. Birds which have developed the acute form of coccidiosis have a dejected, droopy appearance. They become listless and drowsy. The feathers are ruffled and there may be blood on the vent fluff. There is loss of appetite, paleness of the comb and wattles, and the chickens huddle about the source of heat. Diarrhœa occurs and there may be blood in the droppings. Death usually follows in from four to seven days after infection. In cases where the birds do not die but become reinfected, a rapid atrophy of the skeletal muscles takes place and the birds become helpless and unable to stand. The acute

form of the disease appears early in the season and in young chickens.

The chronic form of the disease appears in maturing birds and is characterised by pallor and extreme emaciation, or, as is more often the case, the bird may have an appearance of general unthriftiness.

Diagnosis

Aside from blood in the droppings which may or may not be present, the symptoms described are characteristic of other diseases of chickens. Particularly is this true in the case of chronic coccidiosis where often the only outstanding feature is that of general unthriftiness. Therefore, while the presence of coccidiosis may be *suspected* in a flock, a positive diagnosis of the disease should not be made from external appearances alone. It is advisable for poultrymen to send to a laboratory specimens of birds which show symptoms such as described above, so that microscopic examination may be made.

Scrapings from the lining of the intestinal tract, and the contents of the tract and cæca (blind guts) are examined under the microscope. Large numbers of coccidia will be seen if the bird is affected with coccidiosis. The different portions of the intestinal tract will have a characteristic appearance according to the type or types of coccidia with which the bird is infected, as will be seen from the following descriptions of the various types.

Eimeria tenella.

Size: 22·6μ × 19μ. The oöcysts of *E. tenella* are broadly ovoid in shape. They sporulate within 48 hours. This species attacks the intestinal tracts of chickens in the region of the cæca. Hæmorrhage into the cæca occurs on about the fourth and fifth days after infection (at the stage at which merozoite formation is going on in the lining of the cæca), and death from bleeding may take place on the fifth, sixth or seventh day. *Post-mortem* examination will reveal the cæca to be filled with dark red blood, and this accounts for the presence of blood in the droppings in acute cases of coccidiosis. Sometimes the wall of the cæca may be thickened and have a whitish, milky appearance, or there may be a white, firm, cheesy mass in the cæca. A chicken may recover from *E. tenella* infection, or it may become reinfected, in which case death sometimes results. In other cases a chronic type of the disease may be the outcome of constant reinfection.

Eimeria mitis.

Size: 16·2μ × 15·5μ. The oöcysts are somewhat spherical in shape. They sporulate within 48 hours. The anterior portion of the small intestine is attacked by this species but no visible lesions appear. The health of the bird harbouring this type does not appear to be affected.

Eimeria acervulina.

Size: 19·5μ × 14·3μ. The oöcysts of this species are egg-shaped and they sporulate within 21 hours. They develop chiefly in the upper half of the small intestine. There are no visible lesions and little harm is done to the host.

Eimeria maxima.

Size: 29·3μ × 22·6μ. The oöcysts are egg-shaped and sporulate within 48 hours. The middle and posterior portions of the small intestines are attacked by this species. The intestinal wall becomes greatly thickened due to the swelling of the tissues and the presence of great numbers of organisms. The lining of the affected portion is pale and the surface is covered with a dirty greyish exudate containing large numbers of oöcysts. Often the exudate is blood-tinged or flecks of blood may be present.

Severe spontaneous cases of *E. maxima* infection are exceptional, but mixed infections with *E. maxima* and *E. acervulina* may occur, and when this is the case a chronic type of coccidiosis results which has a marked effect upon the general health of the bird and is indicated by pallor and wasting.

Eimeria necatrix.

Size: 16·7μ × 14·2μ. The oöcyst is broadly oval in shape and sporulates within 48 hours. The sporozoites attack the small intestine and form schizonts in this region, but the second generation merozoites which are liberated invade the cells lining the cæca and, to a certain extent, the large intestine, and further development takes place in these portions of the digestive tract.

Infection with *E. necatrix* results in chronic coccidiosis but an acute form of coccidiosis may occur which is fatal in from five to seven days. The chronic form causes serious damage amongst maturing birds and is characterised by the infection running a prolonged course, associated with gradually increasing emaciation of the affected bird.

Post-mortem examination will reveal the small intestine to be studded throughout its length with white spots which are colonies of schizonts visible to the naked eye. There may be a thickening of the intestinal wall, hæmorrhage, and a yellow-tinged exudate. The unopened intestine may have a spotted appearance due to the presence of the white areas and red blotches of blood.

Eimeria Præcox.

Size: 21·3μ × 17·1μ. The oöcysts are ovoidal in shape and sporulate within 48 hours. Development takes place in the upper third

portion of the small intestine. No gross changes in the intestine are produced by this species although sometimes a mucous cast containing a large number of oöcysts has been noted towards the end of infection.

Mixed Infections.—These species of coccidia may occur singly or as mixed infections. In the latter case there may be a variety of combinations of the various types.

Control

Medicines have been found to be of no value in the treatment of coccidiosis. Since all the types of coccidiosis infections just described die out promptly if reinfection through the ingestion of sporulated oöcysts is prevented, it is obvious that thorough cleaning of the poultry houses so that contaminated droppings cannot be picked up by the birds will be the most effective means of combating the disease. Therefore, if the disease appears in the flock, rigid sanitation must be practised at once. The steps necessary to accomplish this are as follows:—

Remove and burn all litter. Thoroughly clean the brooder houses using a hot lye solution (1 lb. of lye to 40 gallons of water) for scrubbing the floors and dropping boards. Disinfect the water and feed troughs using 5 per cent. compound cresol solution. Remove the litter and sweep the floor clean every 48 hours or preferably every 24 hours. This should be done for at least ten to 14 days. During this time the birds should be confined to the houses.

According to Beach and Freeborn, "Outbreaks of coccidiosis in chicks can usually be promptly controlled by feeding sufficient dry or liquid skim milk or buttermilk and by maintaining proper sanitation in the brooder houses and yards. If the sanitary measures are neglected little benefit from milk feeding can be expected.

"If dry milk is used it should constitute 40 per cent. of the mash. The composition of the mash is not of importance as long as it contains 40 per cent. of dry milk and makes a suitable mixture for feeding to young chickens. A mixture that has been found satisfactory consists of the following ingredients:—

	lb.
Dry skim milk or buttermilk ...	40
Wheat bran	10
Ground grain	50

"Start feeding the mash as soon as the presence of the disease is determined. Keep the mash constantly before the chicks in hoppers or troughs constructed so as to prevent waste.

"Feed grain once or twice daily, but restrict the amount to from one-third to one-half the weight of mash consumed. If more grain is fed, mash consumption will be reduced and less satisfactory results will be obtained. Continue this system of mash and grain feeding as long as there is any indication of the disease. This usually requires from one to two weeks. If desired, the ration can then be very gradually changed to the one in use before coccidiosis started. Do not start the change in the ration too soon nor make it too abruptly. Feed greens as usual. If the supply of greens is insufficient, add one quart of cod-liver oil to each 100 lb. of mash. This is also advisable when weather conditions or weakness of chicks prevents them from running outside.

"When liquid milk, such as buttermilk, or skim milk, is to be used, it should be of good quality. Keep the milk constantly before the chicks in fountains or troughs. If troughs are used, provide covers that will prevent the chicks from walking in them or roosting over them. Provide sufficient containers so that all the chicks can drink freely and the weaker chicks will not be crowded away. Allow the chicks no water. Feed no mash. Feed grain twice daily, very sparingly in the morning and a larger amount at night. Feed greens as usual. Add one quart of cod-liver oil to each 100 lb. of mash if the supply of greens is insufficient or the chicks cannot go out-of-doors. After all evidence of the disease has disappeared, the feeding of mash may be very gradually resumed, water again given, and the amount of milk reduced. Do not start this change in feeding too soon nor complete it too rapidly.

"A condensed milk product, such as semi-solid buttermilk, after dilution, may be used in the same manner as buttermilk. Use one part to two or three parts of water. Greater dilutions are less beneficial. Many poultrymen report satisfactory results from the use of undiluted semi-solid buttermilk. If it is fed in this way, water must be supplied."

Some workers have reported benefit from the treatment of affected birds with vinegar (acetic acid content 4 to 5 per cent.). It has been found that vinegar "in addition to reducing mortality also decreased the amount of hæmorrhage and apparently prevented the formation of a cheesy mass in the cæca of chicks infected with *Eimeria tenella*." The vinegar is administered with the drinking water, one-half-a-pint of vinegar being made up to five gallons with water and given continuously for 12 successive days.

Recently, encouraging results have been reported by poultrymen who used two proprietary products for the control of coccidiosis. One is used in the mash, while the other is added to the drinking water. It is claimed that if fed at regular intervals, chickens will withstand mild attacks of coccidiosis.

Spraying the litter in poultry houses once each week with "Toxite," a proprietary preparation containing mineral oil and phenol derivative, as a control for poultry coccidiosis, has been widely advocated. It is reported to be particularly useful as a preventive, since it inhibits the sporulation of oöcysts.

The use of Epsom salts at the start of an outbreak, in conjunction with frequent changing of the litter and other sanitary precautions, is reported to be of considerable value in controlling fowl coccidiosis.

Iodine administered in various forms (iodine vermicide, Kerr's iodine formula, iodine and molasses) has been reported to be of value in controlling outbreaks of coccidiosis.

Prevention

In view of the damage done to a flock by infection with coccidiosis and the great amount of labour entailed in the control of the disease, it is more practical to *prevent* the occurrence and recurrence of the infection in the flock. There are certain measures which if incorporated in the general management of the flock will ensure comparative freedom from coccidiosis infection.

First of all, sanitation is imperative. The brooder houses, dropping boards, feed and water utensils, should be thoroughly cleaned and disinfected frequently. The litter used should be of a type which may be cleaned and renewed fairly often. Drinking fountains should be raised on a wire platform at least six inches above the ground, then the chickens will not come into contact with the moist soil immediately about the fountains, for it is in such moist soil that conditions are ideal for the development of oöcysts. Mash, as well as grain, should be fed in hoppers or troughs so that the chicks cannot infect the feed by treading on it.

In the matter of clean feeding the Pennsylvania Experiment Station reports that the spread of coccidiosis may be reduced by using suitable feeders. It was found that a 5 per cent. chick loss was experienced where the droppings were kept out of the feed. On the other hand, a 65 per cent. loss occurred where the droppings contaminated the feed. Poultrymen reported a lower chick mortality when both the grain and the mash were fed in sanitary feeders which prevented the contamination of feed with the droppings.

During an outbreak of coccidiosis the litter should be removed every 48 hours and preferably every 24 hours. Every day for twelve to 14 fourteen days the peat moss, cut straw or other convenient litter should be swept out with a stiff broom. In this manner the droppings containing enormous numbers of coccidia will be removed from the premises and thus reinfection prevented.

The coccidial oöcyst cannot develop in the absence of moisture, thus, if the poultry yards and houses are kept dry, much of the infection will be destroyed.

Since it is difficult to disinfect the yards and keep the soil floor free from parasites, a permanent concrete floor which can be kept clean easily is recommended. The concrete yards should be washed thoroughly with water and scrubbed with a broom in the morning and allowed to dry before the chicks are permitted to run outside. Unless some such means are taken to ensure clean yards, two to three year *rotation* of yards must be the rule in order to provide clean soil for the chicks each year.

It should also be borne in mind that adult birds, although apparently healthy, may discharge coccidia in the droppings. Therefore it is necessary to keep young birds from all contact with mature fowl. Also young birds must not be raised on soil previously occupied by older birds. Precautions must be taken to prevent attendants from carrying infected droppings on their shoes from the older stock to the young stock in the brooder houses. Rubber overshoes should be worn by anyone attending to the older birds. The rubbers can then be removed before the attendant enters the brooder houses and yards of the young birds.

The use of wire floors in the brooder houses has been found to be a successful method of preventing epidemics of coccidiosis. The floors must be constructed so that they do not sag and allow the birds to come in contact with the droppings that have passed through the wire mesh. One-half inch mesh wire is recommended for chicks up to six to eight weeks of age, after which three-quarters inch mesh is more suitable.

A similar system is to raise the birds in battery brooders with wire floors for from four to six weeks. The birds are then moved to sun-parlours with wire netting floors for a short time and are then housed in fold pens which are moved to clean ground daily. When the birds have reached the age of three months they are put in the ordinary houses.

While the use of battery brooders or wire floors may find justification on farms that are badly infected with coccidiosis or on farms with very limited range, their use must be regarded only as an aid or temporary means of preventing or controlling coccidiosis. Outbreaks of coccidiosis have been known to occur in chicks kept in battery brooders or on wire floors. Further, if chicks which have been raised in battery brooders or on wire floors are exposed to infection on range or in laying houses, they become a greater prey to coccidiosis than chicks that have been gradually exposed to the disease and have thus acquired a certain amount of immunity. Unlike the case of round worm in-

festation, chickens do not appear to develop any age immunity to coccidiosis. The writers know of a severe outbreak of coccidiosis, with heavy losses, in the case of ready-to-lay pullets, raised on clean range and transferred to laying houses which were infected with coccidiosis. Since the birds were mature the financial loss resulting from the death of each bird was substantially greater than would have been the case if they had been exposed to coccidiosis as young chicks.

Field and experimental observations indicate that nutrition plays a great part in coccidiosis infection. "Food which best promotes growth and vigour, containing the proper vitamins and minerals in addition to the other desirable constituents in the right proportion, is of immeasurable value to the bird in resisting the disease."

It will be readily seen that the measures of control and prevention of coccidiosis are centred in the faithful application of the principles of sanitation and management. The prevalence of coccidiosis in a flock may be taken as an index of the degree of sanitation and care in the managements of the birds.

Adherence to the programme of sanitation outlined in this paper will result either in (1) complete freedom from coccidiosis; (2) the checking of an outbreak; (3) keeping down the infection sufficiently to preclude a severe outbreak; or (4) maintaining a low level of infection and acquired immunity.

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How may the Child be Safeguarded against Bovine Tuberculosis, with especial reference to the Milk Supply?*

A. B. Mattinson, F.R.C.V.S.

In view of the magnitude of the subject, and the very limited time at my disposal, I must confine my remarks within very close limits, and would ask my audience to realise that matters omitted are not left out because of their lack of importance, but solely that one or two relevant aspects may be dealt with a little more fully, yet very briefly.

Very many—perhaps the majority—of people think that the very high incidence of bovine tuberculosis depends mainly upon two factors:—

(*a*) The ignorant, or even malign indifference of the farmer, and—

(*b*) The incompetency of the veterinary profession.

Both these views are formed under grave misapprehension. One must admit that the ethical standard of many milk producers would stand considerable improvement, but, on the most selfish economic grounds, the whole of the agricultural community would support any constructive and practicable scheme which would rid them of this scourge.

The veterinary profession have no legal powers to deal with this disease beyond those contained in the Tuberculosis Order, 1925, but its members have used consistently, continuously, unobtrusively, without advertisement, and often with little by way of thanks or appreciation, their knowledge and influence with their clients to control the clinical incidence of this loathsome disease.

If one were asked to state briefly the cause of the high incidence of bovine tuberculosis, I believe that the correct reply could only be one of the two following:—

(*a*) An act of God, using the term in its legal meaning, or—

(*b*) The grave apathy and dereliction of duty of the State; I know of no other explanation of the present condition of affairs.

I propose to deal with the subject under the following heads:—

(1) Measures dealing with tuberculosis as a disease of bovines.

(2) Measures intended to safeguard the milk supply.

(3) Veterinary inspection of dairy herds.

References are primarily to England and Wales; the figures given are close approximations, or such as are generally accepted, where accurate data are not available.

(1) Measures Dealing with Tuberculosis as a Disease of Bovines

(*a*) The Tuberculosis Order, 1925. This measure has few friends, and many critics, some of whom deny that it has any value at all; experience compels me to say here, that many of these critics have very little actual knowledge of the working of this Order.

My well-considered opinion is, that in its conception and initiation it was an excellent departmental attempt to *commence* dealing with

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a mighty problem; the State was not prepared to bear the cost of any bigger scheme, and little more could have been done with the limited resources and lack of organisation at command at the time.

The cardinally weak point in this Order lay in its *finality*; it would have been much better had it been called, say, the Tuberculosis Order, 1925-1928, with a preamble, or covering memorandum, foreshadowing further developments at the expiry of its currency.

As you are aware, the Tuberculosis Order deals only with certain scheduled forms of disease, *viz.*, tuberculosis of the udder, tuberculous emaciation, and chronic cough, together with clinical signs of tuberculosis. As stated above, the Order is now due for supersession, but, in the meantime, the following criticisms are directed against the points of the Order most requiring strengthening by further Order, or by improvements in administration.

Sec. 2: Notification of the existence of disease in any of the specified forms is obligatory, but is fulfilled more in the breach than in the observance; this is a matter for the local authority.

Sub-sec. iii should end at the word "cough" and a new sub-section, iv, be added, *viz.*, "Any bovine animal showing clinical signs of tuberculosis."

The reason for this is that a great many cattle extensively affected in a clinical sense do not cough, when the disease exists in the form of "grapes," when the lymphatic system is principally affected, or when disease is mainly in the abdominal organs, and/or lymphatic glands. Such may be "open" cases of tuberculosis, but are not notifiable until they reach the stage of emaciation.

Sec. 4 directs the examination of the bovine animals on the premises other than the one suspected or reported. Many local authorities do not insist on this most important duty; I believe that some actually forbid it on the grounds of expense.

Sec. 9: Valuation. I believe that a simplification of procedure here would be useful and economical, and stimulate reporting.

Sec. 10: The precautions to be adopted with respect to milk require a thorough tightening-up. This section should clearly state that prosecution will follow in all cases where the local authority are satisfied that the condition of disease of the udder has not been reported with all practicable speed.

Sec. 11 (i): Restriction of the movement of any affected animal, except after notification of disease to the local authority, should be enforced under penalty, and all knackers and butchers should be compelled to report such cases, in a similar manner as with anthrax. The practice of surreptitiously "getting shut" of clinical cases should be finally ended, and is even now largely within the competence of the local authorities.

Sec. 12: The veterinary supervision of many markets, fairs and sales is non-existent, but most highly desirable.

Sec. 13: The thorough disinfection of infected premises is of the highest importance, yet is seldom properly enforced.

(2) Measures Intended to Safeguard the Milk Supply

Lack of time precludes more than a mention of some of the weakest features of these measures.

(*a*) *The Milk and Dairies (Consolidation) Act*, 1915

Sec. 1 (1) (*c*) empowers the Local Government Board authority to make orders for the inspection of cattle in dairies. I refer later to this subject.

Sub-sec. (1) (*h*) empowers the same authority, now the Ministry of Health, to make such general or special orders, "as they think fit," for preventing danger to health from infected, contaminated or dirty milk. One would like to hear the opinion of Lord Hewart on this aspect of the "New Despotism," but, to a layman, the powers appear much too vague and extensive to have any real use.

Sec. 3 gives power to the M.O.H. to apply the provisions of Schedule I, and completely to stop the milk supply if it is likely to be a cause of human tuberculosis. I believe that this power is too drastic to serve any useful end, as it could only be indicated in the most extreme cases.

Sec. 4 directs the M.O.H. to cause the herd to be inspected from which tuberculous milk is being sold, but requires (Sub-sec. 3) that "sufficient notice of the time of inspection shall be given" to allow the dairyman, the M.O.H. who gave the notice, or a veterinary inspector of the same local authority, and, if desired, the veterinary surgeon of the dairyman, to be present.

This is obviously a sop to the numerous local authorities whose powers under various local Acts were repealed by Sec. 21 of this Act, but, if it does do anything at all to satisfy their pride, it is a dearly-bought concession, which gravely militates against the efficiency of the Act.

It does not appear that either the M.O.H. or veterinary inspector of the local authority who gave the information, nor the veterinary surgeon of the dairyman, have any legal *locus standi*, and I suggest that their attendance is a waste of time and money.

The delay necessary to allow these parties to be present puts a premium upon fraud to anyone so disposed, and enables the worst type of farmer to dispose of diseased stock before inspection takes place.

If no notice of the inspection were given, the effect would be salutary; the innocent farmer would suffer no ill, and the bad type of milk producer would not get away so easily as he does at present.

There is less real good reason for this notice of intended inspection than there is for similar notice in the case of unjust scales or weights, adulterated goods, or other violations of statutes intended to protect the consumer.

Sec. 5, prohibiting the sale, under penalty, of tuberculous milk, would be much more actively enforced if Sec. 4 were amended as is suggested above.

Sec. 10 provides for the combination of local authorities, and for veterinary inspection of herds, to which I refer later.

(*b*) The Milk and Dairies (Amendment) Act, 1922. This supplements the Act of 1915. Sec. 5 forbids, under penalty, the sale of milk from a cow affected with tuberculosis of the udder, but it would appear that this section is rarely enforced.

(*c*) The Milk (Special Designations) Order, 1923, is now largely assimilated into the Accredited Producers' Scheme, referred to below. Certified and Grade "A" (T.T.) herds call for no comment here, beyond the remark that the total gallonage from such herds is insignificant.

(*d*) The Attested Herds Scheme of the Ministry of Agriculture aims at the formation of herds wholly free from tuberculosis, either by elimination of reactors, or the segregation method of Professor Bang.

Strictly, this should have been dealt with under Heading 1, but as the scheme as at present formulated is more likely to safeguard the milk supply to some slight extent, than to have any measurable effect in reducing the incidence of bovine tuberculosis, I have placed it under Heading 2.

Up to the present only a few dozen stock-owners have joined this scheme, which, on a voluntary basis, bristles with difficulties.

Speaking as one who has kept cattle, generally free from tuberculosis, for 28 years, and is intimately conversant with the dairying industry, my considered opinion is that the maintenance of a profitable, tubercle-free dairy herd is, for all practical purposes, a commercial impossibility to-day.

The principle of the tubercle-free herd is a correct one, but hope of its extensive attainment calls for too much optimism, with future disappointment, and one can see little prospect of success for this scheme, unless the State is going to take a much more active part in the control of bovine tuberculosis, and then only through the medium of large-scale local authorities.

(*e*) The Accredited Herd Scheme. My first criticism is on a cardinal error in Grade "A" milk production, *i.e.*, the fact that the owner of the herd must remove from it any cow which reacts to the tuberculin test.

This effectively prevents an owner of limited means from ever grading-up his herd to Grade "A" (T.T.), Certified or Attested standard, whereas he is the very man in the position to be encouraged to do so. I would liberally encourage tuberculin testing of such herds, subject to the branding of reactors, and, say, quarterly biological test of the milk.

It is accepted that the production of milk of Accredited standard requires some higher financial reward than the price of ordinary commercial milk, and this is to take the form of a bonus of one penny per gallon of milk *produced* of that standard. This bonus is to be provided by the Milk Marketing Board from a central fund established by a levy on all milk produced, and the economics of the scheme give rise to wonder.

If, say, all producers reach this standard, they can only obtain the bonus by first paying it as levy, which clearly removes the whole of the gilt from the ginger-bread.

If, say, 10 per cent. only of producers can provide cattle and buildings acceptable to the scheme, these fortunate people are to be subsidised by their poorer relations, perhaps without undue suffering on the part of the latter, but, if 50 per cent. are in the scheme, the remaining 50 per cent. will almost assuredly refuse to bear the burden. Further, if only a small proportion of producers go in for Accredited herds, it is not going to have much effect upon the purification of the milk supply, which is its essential object.

The question of the economics of the M.M. Board would normally not appear to concern us here, but if the purity of the future milk supply is involved, it is a factor of which we must take definite note.

The milk industry is suffering acutely from over-production: I believe that about 12,000,000 more gallons were sent in to the Board in March than in March of last year, and it requires no profound economic calculations to see the inevitable result of this glut, which is deluging the country with unwanted milk, the manufacturing price of which is an appalling drain upon the finances of the scheme.

I believe that the very existence of dairy-farming depends upon the M.M. Scheme, and that its failure must spell disaster; it is necessary to consider if this giant is not standing upon feet of clay. The scheme is a monopoly, and has the weakness as well as the strength of such an institution. The monopolist can only increase his returns by either increasing his sales or prices, by restricting supplies, or paying less for his raw materials; the elasticity of demand for raw milk is very limited; the price of liquid milk to the consumer is already too high; the farmers will resent any reduction of price for the raw material, and are all clamouring against any suggestion of restrictions on supply.

The following extract from the Report of the M.M. Board for April, 1935, speaks for itself:—

"Deductions arise from the following causes: . . . . (*b*) The lower price received for the sale of 30,092,511 gallons of milk surplus to 'liquid' requirements . . . . the average price of which was 5·20 pence per gallon. The effect of this on the total sales of milk is to reduce the 'liquid' milk price by an average of 3·61 pence per gallon."

One wishes the Accredited Scheme well, but, if purer milk can only be got by means of a bonus, which the M.M. Board are unable to maintain, we must be prepared for complete or partial failure of the scheme.

The principles of Gresham's Law extend far beyond currency, and less pure milk—if cheaper—will substantially drive the purer—if dearer—milk from the homes of the more humbly-situated consumer, who, most of all, requires a cheap and plentiful supply of the pure article.

(3) Veterinary Inspection of Herds

Veterinary inspection, solely for the purpose of detection of *tuberculosis of the udder*, has a strictly limited utility, unless accompanied by enlightened and progressive legislative and administrative reform.

The Diseases of Animals Acts all depend for their efficiency on the fact that the *owner* of the affected animal is responsible for the notification of disease, and there is no reason for departure from this wholesome rule.

The pre-clinical phase of disease obviously cannot be detected; the clinical phases of mammary tuberculosis can be detected—not as being specifically tuberculous, but as being abnormal.

This condition can be equally well detected by the owner of the cow; more easily, in fact, as he has the opportunity at least twice daily of palpating the udder immediately after stripping—an opportunity that only falls rarely to the veterinary inspector.

The farmer or dairyman who cannot detect an abnormality in the empty udder is in the wrong line of business, and should be cleared out of it. If care and honesty were continuously applied in this respect, and all suspicious cases reported, the incidence of tuberculous milk would fall much more rapidly than under any form of inspection, short of a positive veterinary inquisition.

Much of the clamour for veterinary inspection arises from individuals or municipalities, ignorant of its proper limitations; the wholly

unnatural clamour for inspection by farmers' associations is largely actuated by the desire to give the child an honourable name and to boost the consumption of milk, by advertising the meretricious fact that the herds are under veterinary inspection—in other words, to make the veterinary profession "carry the baby."

When every milk-producer realises that if, by reason of indifference, apathy or incompetence he fails to notify suspicious abnormalities of the udder he is exposing himself to the risk of prosecution, to show cause why he should not be deprived of his producer's licence, we shall have made substantial progress in dealing with this loathsome scourge.

Although I believe that no form of inspection short of actual inquisition can replace notification by the owner, this does not mean that I am not wholly in favour of supervision of the industry by practical veterinarians.

Mere inspection roughly means that, say, 5 per cent. per annum of cows in milk will be detected, as, and when, the disease becomes clinically manifest; there is no good reason to spend public money on this type of duty, in perpetuity, unless it is to be accompanied by progressive measures directed to the further control and eventual elimination of bovine tuberculosis.

Summary

I would submit the following postulates for your consideration as being sufficiently accurate for all practical purposes:—

(1) Any cow *giving tuberculous milk* to-day will be dead within a year.

(2) Any cow *affected with tuberculosis* to-day will be dead in five years.

(3) Practically every cow which will be giving milk in 1940 is either yet unborn, or is at present free from tuberculosis.

If you accept these statements as approximately accurate, certain lines of progress are indicated which I can only briefly mention here.

Personally I believe that a complete overhaul of the various Acts and Orders referred to will be necessary, but the following suggestions indicate some methods by which the incidence of clinical bovine tuberculosis might be brought under control:—

(i) Tightening-up of the Tuberculosis Order, and Milk and Dairies Acts, on the lines suggested above.

(ii) Statutory warranty of sale that all cattle have passed the tuberculin test, progressing over a period of years, through the following channels: Animals under the Livestock Improvement Scheme; Milk Recording Societies and Breed Society's sales, after, say, one or two years' notice.

(iii) Similar warranty, actual or legally implied, at all auction mart and farm sales, after, say, two or three years' notice, and to all sales, private or otherwise, after five years' notice.

(iv) Bonus of, say, threepence per gallon on 100 gallons of milk used at home in rearing a heifer calf, with a bonus of, say, 10 per cent. on the selling price on the same when sold as a "springer" or "down-calver," at not less than two-and-a-half years old, subject to passing the tuberculin test, applied at the cost of the local authority if the animal passes. This would ease the milk glut enormously, and provide us with healthy stock to replenish our herds.

(v) A similar bonus on rearing an approved stud bull, at two years old, or a bullock or barren heifer at 18 months old; this would supply our graziers with a sufficiency of healthy forward stores for feeding purposes, and benefit both the dairy and arable farmer.

(vi) Legislation for the control of bovine abortion and Johne's disease, the ubiquity of which in many areas completely stultifies the essential requirements to maintain a tubercle-free herd.

(vii) A new Order of the Ministry of Agriculture, regulating the housing of animals and correlating the housing accommodation with the number of milking cows from which milk may be sold to the M.M. Board.

(viii) Veterinary supervision, under the administrative control of large-scale local authorities, of dairy herds with the object of reducing *clinical*—not merely *mammary*—tuberculosis at its earliest manifestation, and to ensure a general tightening-up of control along with a progressive educational policy to all producers.

In conclusion I would direct your attention to the following extracts from the report on the working of the Tuberculosis Order for 1933 for England and Wales only:—

Total number of animals slaughtered under the Order		17,761
Suffering from advanced tuberculosis	11,899	67·0%
Suffering from tuberculosis not advanced	5,754	32·4%
Not affected	108	0·6%
Results of *post-mortem* examination:—		
(1) Giving tuberculous milk	486	2·8%
(2) Tuberculosis of the udder	3,149	17·8%
(3) Tuberculous emaciation .	6,883	39·0%
(4) Otherwise affected ...	7,144	40·4%
Percentage of milk and udder cases amongst animals affected		21·2%

It is a very reasonable assumption that all the 39 per cent. of cases of tuberculous emaciation, and a very large proportion of the 40·4 per cent. otherwise affected, were excreting tubercle bacilli in their milk, and I would ask you if it is not of much greater importance to eliminate these groups than concentrate wholly or principally upon the very much smaller group showing udder lesions. In short, the tuberculous udder is merely a by-product of the tuberculous cow, which should be the definite object of attack, but is liable to be overlooked by excessive attention to the tuberculous udder.

Another item worthy of notice is the following:—

Animals dealt with under the Tuberculosis Order in 1933

Country.	Number of animals dealt with.	Average compensation per animal.	Average amount of salvage per animal.
England ...	16,396	3 8 6	15 0
Scotland ...	3,147	3 9 3	12 0
Wales ...	1,365	3 9 10	5 5
Great Britain	20,908	3 8 8	13 11

Allowing for various factors affecting these figures it is quite obvious that we had, in 1933, some 20,000 cattle in our dairy herds substantially valueless, and a source of great danger to other animals and to human health. I have no hesitation in saying that under active veterinary supervision, at least double this number of useless and dangerous cattle would be eliminated, in the next twelve months.

I believe that the county of Lancaster is at least as well governed as any other large public authority, and perhaps better than most, and

although one hears much criticism of its extravagance, one does not hear it accused of parsimony.

The following compilation from the accounts for the year ending March 31st, 1934, may be of interest:—

Tuberculosis Order: Receipts.	£.	Rate in the £.*
Refund of special costs ...	1	
Tuberculosis Order, 1925.		
Grant from Ministry of Agriculture	1,555	0·0427d.
Sale of carcases	748	0·0205d.
Totals	£2,304	0·0632d.
Expenditure	7,661	0·2103d.
Receipts	2,304	0·0632d.
Net expenditure ...	£5,357	0·1471d.

* Penny rate estimated to produce £36,416.

May I ask you all most seriously to consider whether the present Acts and Orders, and an expenditure of a rate of one-seventh of a penny in the pound, are going to give any substantial assistance in safeguarding the health of the child from the ravages of bovine tuberculosis?

The restoration of prosperity to the countryside is inextricably interwoven with the public health, especially the health of little children in this matter, and it is a travesty of the King's English to speak of a nation as civilised, where no sincere efforts are made to control the ravages of bovine tuberculosis.

MINISTER OF HEALTH ON NEW MILK GRADING ORDER

Sir Kingsley Wood, the Minister of Health, replying to a deputation from the Certified and Grade A (Tuberculin-Tested) Milk Producers' Association, said that as regarded the proposed new grading of milk from tuberculin-tested herds the draft Order followed the recommendations of the Cattle Diseases Committee of the Economic Advisory Council. The production of these high grades of milk was, unfortunately, still small, and from the consumers' and the public health point of view the present grades of certified and grade A (T.T.) milk were almost identical. While he would consider the views expressed by the deputation, he did not think a case could be made for continued differentiation between these grades, and he believed that the unfortunate results which the deputation feared would be unlikely to follow in practice from the proposed new grading. Moreover, the draft Order would enable milk bottled on the farm to be so labelled. The proposed transfer of functions from the Ministry to local authorities was also in accordance with the Report of the Cattle Diseases Committee. The detailed control of conditions on individual farms was not an appropriate function for a central department, but the Ministry would do their best to secure uniform administration and would give all assistance in their power to local authorities. On several other points raised by the deputation he hoped to be able to meet their views.

Clinical Communications

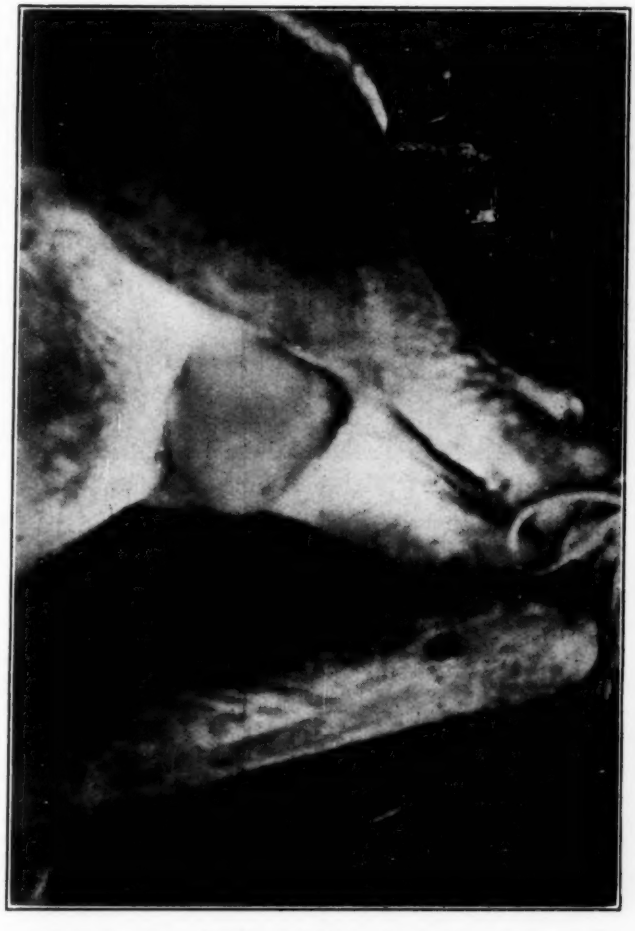
A CASE OF PERI-ORCHITIS CHRONICA UNILATERALIS IN AN OX DUE TO LAY CASTRATION

DJATKOVA STERK AND B. OSWALD
Skoplje, Yugoslavia

Subject.—Four-years-old Montafuner ox.

History.—One year ago the patient was bloodlessly castrated by a layman. Soon after the animal showed a big enlargement in the scrotal region, but remained capable of work. This enlargement still persists.

Examination.—The patient is apparently in good health and condition. In the scrotal region he shows a head-sized, elastic, hard, cool and painless enlargement. The inguinal region is normal. The right testicle and the funiculi are palpable. Puncture of the enlargement shows pus. (See Fig. I.)



Diagnosis.—Peri-orchitis chronica sinistra.

Treatment.—Scrotal region disinfected, and 10 c.c. of a 3 per cent. novocain solution subcutaneously inoculated as local anæsthesia. An incision was made in the mid-line, and the

enlargement as well as the right testicle were removed by means of a ligature and emasculator. The scrotal cavity was disinfected with half-a-litre of a 1:1,000 rivanol solution, and partially sutured to allow free drainage. The patient made an early recovery.

Post-operative Examination.—The tumour-like body had a weight of 2,980 grammes and a diameter of 18 cm., while the right, free testicle weighed only 190 grammes. When a transverse section was made through the tumour about 1,120 grammes of pus were evacuated, and the left testicle appeared normal in size, but necrotic and yellow stained. On transverse section this testicle retained a little of its structure, but the funiculi of both testicles were obliterated and necrotic. The capsule had a thickness varying from ½ to 2 cm., and consisted of two well-marked walls, probably of both the tunica vaginalis communis and tunica dartos. The enlargement has been nourished by means of cutaneous collateral veins. (See Fig. II: 1, the capsule; 2, the left, and 3, the right testicle.)

Bacteriological examination of the pus gave a negative result, nothing but cell-detritus having been found.

Discussion.—This clinical case is a somewhat sad commentary on the cruelty to animals resulting from continuance of the performance of this operation by laymen.

* * * * *

PROSTATITIS IN A SHEEP DOG

A. WILLIAMS, M.R.C.V.S.,
AND
A. T. PHILLIPSON (Class D), R.V.C.
Ramsey, Hunts

Subject.—Aged sheep dog, Collie type.

History. — Seven months previously, abdominal swelling and obstinate constipation. The dog recovered under treatment.

July 3rd.—The dog had been developing similar symptoms for four days.

Symptoms.—Distension of the abdomen, loss of appetite, lack of energy—the dog could not walk more than a dozen steps without resting. On auscultation of the heart, gross mitral regurgitation.

Diagnosis.—Ascites due to incompetence of the auriculo-ventricular valves of the heart.

Prognosis. — Improvement, but the dog always an invalid.

Treatment.—An enema was given and digitalis prescribed in 7 minim doses every four hours, to be reduced later.

July 5th.—The dog was worse, the abdominal swelling was greater, although the heart's action had improved.

On enquiry it was found the dog had not passed urine since the last visit and had had difficulty in passing it for some time.

Around the prepuce was matted green pus.

On rectal examination a slight enlargement was felt above and to the left of the urethra. A probe was passed up the urethra and no calculus was found. A catheter was passed and half-a-pint of strongly alkaline urine was drawn off with difficulty owing to the abdominal distension.

A second diagnosis of prostatitis was made and destruction advised.

Post-Mortem.—A large cyst, the size of a cocoanut, occupied the whole of the abdominal floor. It had a thick fibrous wall covered with vascular gelatinous tissue which also extended over the bladder and prostate gland. The inside was smooth and white. It contained a quart of brown liquid with a thick, pale-brown sediment. There was no communication between the cyst and the bladder or urethra or prostate.

The cyst was adherent to the ventral wall of the bladder. The bladder was enlarged and thickened and still contained one pint of strongly alkaline urine. The interior of the organ revealed evidence of a chronic cystitis. The prostate had fallen over the brim of the pelvis. It was the size of a tangerine and contained a large abscess full of green pus. Its attachment to the urethra was very fibrous.

The abdominal viscera were congested. The liver showed patches of necrosis. There was no ascites.

The heart was enlarged and both mitral and tricuspid valves were thickened, while vegetations were present around the chordae tendinæ.

Discussion.—*Post-mortem* revealed that the condition of the heart was of minor importance, but the great abdominal distension led to the diagnosis of ascites, the presence of the cyst not being suspected.

It is possible that in the previous attack an abscess in the prostate burst internally, the contents becoming encapsulated in a local area of peritonitis and the cyst was formed, which had been slowly enlarging ever since. It would be interesting if other possible explanations were forthcoming.

TAPE-WORM VOMITION BY DOGS: AN ENQUIRY

F. E. TURLE SAINT, L.R.C.S., L.R.C.P.E.

I have a small dog, a papillon, aged nine years. He has been passing segments of tape worm for the last three years and has been treated for it. One day recently he had some pieces of raw meat for his dinner with a little custard; two hours later he was very sick and brought up all the meat with about three-and-a-half feet of segmented flat-worm. I put it into a vessel containing water. It was in three pieces—one piece appeared to be attached to a piece of the meat and tapered to the end nearest the meat, but on separating it I could not see the rounded head. It was just like the tape-worm he passes after being treated. In the water one piece about 14 inches long was very active but all the rest was immobile. I should be interested to learn if tape-worm has been recorded before to have been vomited by a dog. I do not remember that it occurs in man.

[In a later communication Dr. Turle Saint observes: "As suggested by you, I wrote to Mr. E. L. Taylor, of the Ministry's Laboratory, and he tells me that, although rare, vomition of tape-worm by dogs does occur. He thinks I might try 'Nemural'—a new drug brought out by Bayer's: 'it is comparatively safe and very effective.'"]

THE RE-BUILDING AT CAMDEN TOWN

Satisfactory progress is being made with the re-building of the Royal Veterinary College, London. The Beaumont Animals' Hospital, the Canine Hospital, the Ride and the Pathological Research Institute and Museum have all been completed and are in use.

The main block, which will contain a large assembly hall, the administrative offices, lecture-rooms, laboratories and quarters for students, is now being erected.

* * * * *

ALLEGED CATTLE POISONING: CLAIM FAILS

In Kilmarnock Sheriff Court Sheriff A. Martin Laing has issued judgment in the action in which Messrs. R. Morton and Sons, farmers and cattle dealers, Townhead, Newmilns, sued Messrs. R. Torrance and Sons, painters and decorators, Galston, for a sum of £148, being the price of four cattle which they alleged to have been poisoned, as well as for veterinary and other expenses. The Sheriff finds that the pursuers have failed to prove their case, and assoilzies the defenders, granting them expenses against the pursuers.

In the course of a lengthy note the Sheriff says the pursuers must not only prove that the cattle were poisoned by eating paint containing lead, or eating red or white lead, but that such lead or paint was that of the defenders, and—most important of all—that the cows got access to that paint through the fault and negligence of the defenders or their servants. In that they had, in his opinion, completely failed. Pursuers' onus was a difficult and heavy one. Their case was largely circumstantial.

Abstracts

[**Discussion on Nutritional Anæmias.** Orr, J. B., Vaughan, Janet M., *et al. Proc. Roy. Soc. Med.* (1935.) *28*. 469-480.]

Sir John Boyd Orr, who opened the discussion, referred to the fact that whilst a deficiency of either iron or copper was known to cause anæmia, there was some evidence to suggest that calcium was also important, in that it had a sparing effect on iron, whilst magnesium, arsenic and certain other metals have been credited with having an influence on the formation of hæmoglobin and red cells. The minimum daily requirement of iron for an adult human is about 6 mg. and the majority of present-day dietaries would supply this amount. The iron contents of bovine and human milks range from 0·027 to 0·140 mg. and 0·05 to 0·19 mg. respectively per 100 c.c. The administration of iron to the mother does not necessarily increase the amount of iron in the milk. For efficient absorption iron should be administered in the ferrous form. The part played by copper appears to be concerned with the mobilisation of the iron in the liver and the subsequent synthesis of hæmoglobin, the process being greatly facilitated by the presence of copper. Milk is poor in copper, cow's milk containing 0·012 to 0·02 mg. and human milk 0·04 to 0·08 mg. per 100 c.c. The young of many species appear to be born with a store of copper in the liver, for the copper content of the livers at birth for the human, ox, pigs, guinea-pigs, rabbits and rats appears to be higher than at adolescence.

A physiological anæmia occurs commonly in young pigs, especially those kept in confinement on cement floors, and occasionally in lambs kept in confinement and weaned on to cow's milk. The hæmoglobin level in the young pig normally falls steadily from about 11 g. at birth to about 8 g. on the tenth day, when a rise follows if iron is administered. If, however, iron should be absent from the diet the hæmoglobin content may fall to as low as 15 to 20 per cent. of the normal value when symptoms of severe anæmia develop. Recovery usually follows the administration of iron. By feeding poultry experimentally on diets deficient in iron or copper, anæmia can be produced which is readily cured by the subsequent administration of the absent metal.

Another form of anæmia, most severe in young animals but occurring in adults, affects herbivora grazing on certain well-defined areas, *e.g.*, the "bush sickness" of New Zealand, the "nakuruitis" of Kenya, the sheep anæmia of certain parts of South Scotland. The soil of these areas appears to have a low content of iron and the administration of this element

frequently appears to effect a cure. As, however, the hæmoglobin content of diseased animals may not be very low in this disease it is doubtful if shortage of iron is really the cause; possibly it is a copper deficiency. In Florida a condition exists known as "salt sick" which may affect all animals. Although here the soil has a low content of iron the administration of iron alone does not bring about a cure, which, however, is affected by iron and copper together.

Dr. Janet Vaughan discussed the group of anæmias that appear to be benefited by the administration of liver or liver extracts. They are all megalocytic and hyperchromic while the bone marrow shows hyperplasia of the more primitive red cells. Included in this group are (1) tropical megalocytic hyperchromic anæmia, (2) Addisonian pernicious anæmia, (3) pernicious anæmia of pregnancy, (4) tropical sprue, (5) megalocytic hyperchromic anæmias associated with *Dibothriocephalus latus* infestation. Some of these anæmias respond as satisfactorily to preparations of whole stomach or autolysed yeast as they do to whole liver. The hæmopoietic factor in the liver appears to be formed by the interaction of an extrinsic factor (contained in autolysed yeast, beef muscle, in wheat germ and in egg yolk) with a substance, possibly an enzyme, secreted by the stomach. Presumably the product is absorbed from the alimentary tract and stored in the liver.

It is probable that the essential etiological factor in tropical megalocytic hyperchromic anæmia is a deficiency in the extrinsic factor but in Addisonian anæmia the deficiency appears to be one of the intrinsic. Although the essential deficiency in the megalocytic hyperchromic anæmias is that of the hæmopoietic factor, there may be an associated mineral deficiency and hence the addition of iron as well is of benefit in treatment.

W. R. W.

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[**The Effects of Fluorine on Respiration, Blood Pressure, Coagulation and Blood Calcium and Phosphorus in the Dog.** Greenwood, D. A., Hewitt, E. A., and Nelson, V. E. *J. Am. Vet. Med. Ass.* (1935.) *86.* 28-41.]

The harmful effects in farm animals and the production of mottled enamel in man, due either to the feeding of phosphate-minerals containing fluorine, or to the drinking of waters containing excessive fluorine, prompted the authors to study some of the effects of fluorine administration in the dog.

Intravenous injection of small amounts of fluorine (from 1·5 to 5·3 mg. of fluorine as sodium fluoride per kilo bodyweight) increased the rate of respiration; if the dose was raised to 16-31·7 mg. a definite fall in blood pressure was also observed. The oral administration of from 0·45 to 4·5 mg. of fluorine as sodium fluoride per kilo caused change in either blood calcium or acid-soluble inorganic phosphorus, in hæmoglobin and in the time required for coagulation. Ingestion of these amounts of fluoride by puppies led to the development of mottled enamel of the permanent teeth, such as is seen in man and rats. In no case was dystrophy of the deciduous teeth noticed, nor could any changes in the bones of dogs receiving these doses be detected by means of radiographs.

W. R. W.

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[**Acid-base Balance in Cows and Ewes during and after Pregnancy, with especial reference to Milk Fever and Acetonæmia.** Sampson, J., and Hayden, C. E. *J. Am. Vet. Med. Ass.* (1935.) *86.* 13-23.]

A biochemical analysis of the blood and urine of many normal and diseased cows and ewes is reported and the following conclusions are made by the authors.

(1) The alkali reserve (CO_2 capacity of the plasma) is slightly lower, whilst the serum calcium and blood ketones are slightly higher in pregnancy than during the first few days and perhaps weeks after parturition in cows.

(2) There is a lowering of the alkali reserve and serum calcium in (*a*) milk fever, (*b*) milk fever with acetonæmia and in (*c*) acetonæmia in cows. The calcium average is about half the normal average in the first two of these disturbances.

(3) The ketones of the blood and urine show an increase, especially in those cases classed as a combination of milk fever with acetonæmia and as acetonæmia. In the latter disorder the increase may be more than 20 times greater than the normal average for blood and over 150 times the normal average for urine.

(4) The urine ammonia-N. is usually above the normal in milk fever complicated with ketosis and in those cases classed as acetonæmia.

(5) Examinations made on a few animals suffering from one of several diseases (pneumonia, hæmorrhagic septicæmia, Johne's disease, abortion, etc.) showed no abnormality in alkali reserve, serum calcium, blood and urine ketones and urine ammonia-N. values.

(6) It is suggested that there is a close etiological relationship between milk fever and acetonæmia.

(7) A marked ketosis and an extremely high ketonuria are usually associated with pregnancy disease of ewes.

W. R. W.

[**Experiments with the Virus of Infectious Ectromelia. The action of Immune Serum *in vivo* and on the Growth of the Virus in Culture.** Downie, A. W., and McGaughey, C. A. (1935.) *J. Path. Bact. 40.* 297.]

In a previous paper [*J. Path. Bact.*, 1935, *40*, 147] the authors reported the successful cultivation of the virus of "Infectious Ectromelia" of mice in a medium containing mouse embryo tissue, mouse serum and tyrode solution and also described the formation of "inclusion bodies" in such tissue cultures. The present paper deals with the effect of immune serum on the growth of the virus in such a medium. Multiplication of the virus was apparently inhibited for several days by the action of immune serum, but after eight to twelve days' incubation of the cultures containing immune serum, evidence of growth of the virus was obtained. This is a very interesting observation. There was found to be a fairly good correlation between the presence of inclusions in the sections and the infective titres of the ground-up tissues from corresponding culture flasks.

No evidence was obtained which might serve to explain why the inhibitory effect of the immune serum lasted apparently only a few days. The possibility was considered that the neutralising properties of the immune serum employed may have become diminished gradually at incubator temperature, although this would seem unlikely. One experiment made to control this showed that immune serum after incubation with mouse tissue and tyrode solution for twelve days still retained *some* neutralising property, but as pointed out, further experiments would be necessary to determine whether any appreciable diminution of that property may occur. An interesting observation made was that the pieces of tissue in the culture showed signs of degeneration in the centre after several days' incubation and the possibility that the growth of virus after eight to ten days in tissue cultures containing immune serum may have been due in part to a lessening in the vitality of the tissue cells, could not be ruled out.

Samples of tissue culture medium containing immune serum and virus were inoculated into mice before incubation and these produced no reactions; after incubation virus was demonstrable. The authors conclude that "it would seem that the cells in tissue cultures were not as effective as cells *in vivo* in rendering the virus inactive in the presence of immune serum." [The immunity and other defence mechanisms which take place in the living animal are not exactly reproducible in tissue cultures and the tissues of the adult living mouse may be less susceptible to extremely small doses of "unneutralised" virus than embryonic tissues, especially as disposed in tissue cultures. The immune serum employed in these experiments may not have been of a sufficient potency to neutralise all the virus added, the extremely small amount of "unneutralised" virus, undetectable when inoculated into mice in the serum-virus mixture, might gain access to the cells in the tissue culture, these cells being more susceptible and at the same time more accessible to attack by the virus. There it would appear to be held in check by the immune serum owing to the slow multiplication of a minimal dose of virus. Once, however, it got a hold a more rapid increase of virus would occur. As suggested by the authors, the decrease in the vitality of the cells in the culture might also play its part in the picture.]

I. A. G.

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[**Anthrax in Domestic Animals: Results of Recent Research.** Albrecht, A. (1934.) *Deuts. Tierärztl. Wschr. 8.* 42.]

Albrecht summarises the findings of various authors with regard to such aspects of the problem as the diagnostic tests, disinfection of hides and methods of immunisation, embodied in work published prior to 1932.

Imported hides and material of animal origin appear to be the most serious sources of infection. The consensus of opinion is in favour of the Ascoli precipitin test being the most reliable method of detecting infected hides. A negative result may be accepted but a small proportion of positive reactions appear to be inaccurate.

Unlike such commodities as bone and meat meal, hides cannot be properly sterilised without injury. The pickling method of Hohnstein, as also the use of sodium sulphide in conjunction with such salts as sodium fluoride, calcium arsenite and others, reduces the number of spores to a minimum.

The method of treatment adopted is influenced by the conditions of the outbreak, the species of animal affected, etc., but each of the recognised methods, or varieties of these, has its supporters. The simultaneous sero-vaccination method (Sobernheim) may be applied to those animals which do not show a rise in temperature, three days after the outbreak of disease on a particular premises. Eight days later 0·5 c.c. of Pasteur's No. 2 vaccine is given. Animals should receive only soft food until the sixteenth day of the outbreak, when infected fodder may be given with impunity. Some authors give serum five to six days before the first vaccine, being of the opinion that it has a neutralising effect if given simultaneously. Another writer prefers to give a single intradermal injection (Besredka) of Pasteur's No. 2 vaccine (0·5 c.c. for the horse followed by 5 c.c.

of serum subcutaneously and 0·2 c.c. for the sheep and pig). The use of an aggressin does not meet with favour.

The camel has been found to be a satisfactory animal for the economic production of anti-serum.

N. S. B.

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[Experiments on the Portal of Entry of Bacteria and the Production of Intestinal Infection. Teale, F. H. (1934.) *J. Path. and Bact. 34.* 2. 391-407. (15 refs.)]

From the experiments recorded in this article which shed a somewhat new light upon the mechanism of intestinal infection, the following facts may be ascertained.

Bacteria may gain access to the tissues through the intact buccal pharyngeal mucous membrane, reach the regional lymphatic glands, multiply there and invade the blood stream. On reaching the alimentary mucosa they are excreted through its entire length. Whether disease occurs or not depends upon the relative resistance of the mucosa to the particular organism.

The physiologically active hydrochloric acid of the gastric juice, at full strength (0·32 g. HCl per cent.) destroys the great majority of bacteria, although repeated oral dosing will overcome this. Certain organisms such as *M. tuberculosis* and spores are, however, not affected.

Bacteria which do not belong to the normal intestinal flora do not multiply and are inhibited by the competitive action of the normal inhabitants.

Infection may therefore take place only when the permeability or resistance of the intestinal mucosa is altered and a sufficient number of organisms gain access to the tissue of the intestine indirectly *via* the buccal mucous membrane, or directly, because they have been protected against the germicidal action of the acid of the stomach, as may occur when there is a temporary or permanent disturbance of the gastric secretion, when bacteria are hurried through in large quantities of water or when the acid is neutralised sufficiently to produce a degree of hypochlorhydria.

N. S. B.

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[Canine Skin Diseases and Sulphur Baths. Bouchet, M. *Bull. Acad. Vét. France.* 7. 9. 391-394.]

Details are given for the construction of a cabinet suitable for the application of sulphur fumigation in the treatment of canine skin diseases, particularly mange. The front panel is removable, and made in two sections, which when assembled leave a circular aperture fitting the neck of the patient. A number of panels with varying-sized apertures enable the apparatus to be used for dogs differing largely in size. The fumes are generated in a compartment adjoining the back, and gain access through a number of perforations.

The author advises one hour's treatment on three occasions at intervals not stated, in cases of confirmed mange. The head is presumably treated with the usual parasiticidal dressings.

J. W. H. H.

Reports

VETERINARY SERVICE OF PALESTINE

Report for the Year 1933-34

The organisation consists of the following divisions: Field, Laboratory, Quarantine, Stock farm, Field Stock breeding, Poultry, Apiary. The whole of the work is supervised by Veterinary Officers under the direction of the Chief Veterinary Officer. A note that, despite additional duties, there has been little increase in the staff since the establishment of the veterinary branch, indicates that each member is fully occupied. The staff now consists of 15 Veterinary Officers and 106 others.

The severe drought, during the period under review, was responsible for much abortion and for losses from poverty which have so depleted the herds that it will be some three or four years, under good conditions, before the losses can be made up. As, however, grazing prospects are so bad, there is a possibility of further extensive losses unless there is resort to supplementary rations. Under such conditions, it is fortunate that serious outbreaks of disease have not occurred. Naturally, losses from tick-borne disease, amongst animals already emaciated, have been heavy. The demonstrations of the efficacy of dipping have had to be curtailed on account of the scarcity of water and grazing. It is most unfortunate that where regular dipping would be of the greatest advantage, conditions often render it impossible. Contagious abortion, anthrax, and quarter evil are gradually being rendered of little importance by control measures and preventive inoculation. Tuberculosis is estimated to be present to the extent of 1 per cent. in village animals and 20 per cent. in dairy stock. A scheme for attempting the eradication of this disease awaits the necessary funds. Other diseases are of minor importance.

Inspection of meat is carried out at 30 centres, the chief causes of rejection being conditions due to cysts and worms. Officers of the department undertake the selection and treatment of the horses of the police service and of the British troops in Palestine. The improvement of stock is being effected by breeding suitable sires for crossing purposes on the government farm and the issue of premium bulls to villages. The issue of an approved bull is made dependent upon the sterilisation of the unsuitable males already in the herd. The improvement of sheep, goats and pigs, is receiving attention and bee-keeping is being fostered. In the laboratory, the examination of smears, preparation of vaccines and a certain amount of investigational work occupy the full time of the staff.

The detailed report covers 89 pages of interesting matter and demonstrates the wide scope of the work undertaken. It is indeed gratifying to find that the department is facing the problems of the whole of the animal industry and is not confining itself to the disease aspect only. Only a perusal of the report will demonstrate the importance of the work to the advancement of Palestine.

J. S.

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Department of Agriculture, Fiji

REPORT OF THE VETERINARY DIVISION FOR THE YEAR 1933

The division is staffed by two Veterinary Officers, one Stock Inspector and four native assistants.

The most interesting thing in the report is the explanation that all male breeding animals must be licensed; those considered unfit are castrated. This progressive state of affairs is somewhat discounted by the statement that it is becoming difficult further to improve stock because of the lack of suitable sires. All that can be done is to choose the best of these availab'e. There is no source from which the smaller farmers can obtain suitable breeding animals.

With the exception of a certain amount of tuberculosis (rather high in dairy stock) and abortion, there is little disease of any importance. Grazing is good, but the lack of markets makes attempted expansion of either the beef or dairy industry inadvisable.

J. S.

AGRICULTURAL RESEARCH COUNCIL

The Agricultural Research Council have accepted with regret the resignation of their Secretary, Sir William Cecil Dampier, who has held office during the first four years of the Council's existence. Dr. E. J. Butler, Director of the Imperial Mycological Institute, will succeed Sir William.

N.V.M.A. Divisional Reports

MIDLAND COUNTIES VETERINARY MEDICAL ASSOCIATION*

ANNUAL MEETING AT BIRMINGHAM

The annual meeting of the Midland Counties Veterinary Medical Association was held at the Grand Hotel, Birmingham, on Friday, March 29th. The President, Mr. G. F. Banham, occupied the Chair, and there were also present: Messrs. R. H. H. Over, H. W. Griffiths, J. W. Conchie, F. Chambers, T. Marriott, H. Yeomans, A. A. Forsyth, S. Jennings, W. S. Davison, C. M. Peatt, S. L. Hignett, C. G. Allen, B. DeVine, S. M. Woodward, T. B. Yarrow, F. C. Davidson, G. Durrant, A. A. Whyte, C. Munro, L. B. Caffrey, W. L. Sheffield, H. Thornton, W. H. Brooke, J. Cormack, J. Martin and the Hon. Secretary (Mr. H. W. Dawes).

Nominations and Election.—Mr. DeVine nominated Mr. Joseph Caffrey, of the City of Birmingham Veterinary Department, for membership of the Association.

The following gentlemen, duly nominated at the previous meeting, were now elected: Messrs. C. M. Peatt and S. L. Hignett, of the City of Birmingham Veterinary Department, and Messrs. J. H. Findlay and R. W. Wilson of the Staffordshire County Council Veterinary Department.

The "National" Subscription.—The Hon. Secretary read a letter from the National Veterinary Association inviting the opinion of this Association on the desirability of a composite subscription covering membership both of the "National" and Divisional Associations. He said no scheme had as yet been propounded, and this was merely a feeler to ascertain what the provincial societies thought about it. He (Mr. Dawes) thought it would lead to difficulties, and worst of all, the provincial societies would be in danger of losing their individuality. The only asset of this Association was the income derived from subscriptions, and if that went they might find themselves in a helpless position. He was of opinion that such an arrangement would not be in the best interests of this Association.

Mr. DEVINE thought it would have been better if the N.V.M.A. had put forward some definite scheme. That would have been a better basis for discussion.

Mr. OVER said the idea was that every member of a provincial association should be a member of the "National" as well. The subscription to the N.V.M.A. was two guineas, and unless some composite fee were proposed, it meant asking members of this Association who

* Received for publication July 16th, 1935.

were not already members of the "National" to pay two guineas in addition to their present subscription of ten shillings. He was afraid some of them might kick. He could not agree to striking off any member of this Association because he objected to paying the extra fee to the "National."

Mr. Brooke said there was nothing like local autonomy, which they would stand to lose if this idea were carried out. Each provincial association had its own way of managing its affairs, and it would be unwise to interfere with it. He was quite sure local associations would not be as well governed by the "National" as they were at present.

Mr. Forsyth expressed the view that it would be a difficult matter to rope every member of this Association into the "National," which was what appeared to be aimed at.

It was eventually agreed that the Hon. Secretary should reply to the "National" that, in the absence of details of the proposed scheme, this Association was not prepared to express an opinion.

National Horse Association. — The Hon. Secretary read a letter from the National Horse Association of Great Britain, enclosing a copy of the annual report and expressing the hope that this Association would renew its annual subscription of one guinea. It was resolved that this be done.

Tailwaggers' Circular.—Mr. Martin referred to the circular issued to veterinary surgeons by the Tailwaggers' Club, and asked what members thought of the form they were asked to fill up and return.

Mr. Griffiths thought it would be in their interests to comply. As he understood the position, the Tailwaggers' Club kept a record of veterinary surgeons to whom they could refer their members who might apply to them for information concerning their dogs.

The Hon. Secretary said the Tailwaggers' Club had a correspondence bureau. To fill in the form entailed no obligation on veterinary surgeons, but it might be in their interests to do so.

Treasurer's Statement.—Mr. Brooke presented his financial statement. He said the balance sheet had been audited and found correct. The balance brought forward from the previous year of £70 2s. 8d. had been reduced to £58 6s. 10d., which was explained by the number of members in arrear with their subscriptions. There was a sum of £100 invested in War Stock.

Victoria Veterinary Benevolent Fund.—On the motion of Mr. Brooke, seconded by Mr. Over, it was resolved to continue the annual subscription of five guineas to the Victoria Veterinary Benevolent Fund, and again to supplement this with a donation of £5.

Election of Officers

The Hon. Secretary presented the report of the Council recommending the following appointments to office for the ensuing year:—

President.—Mr. J. R. Barker.

Vice-Presidents.—Messrs. G. F. Banham, H. W. Dawes and W. F. Aston.

Hon. Treasurer.—Mr. W. H. Brooke.

Assistant Hon. Treasurer.—Mr. A. A. Forsyth.

Hon. Secretary.—Mr. H. W. Dawes.

Auditors.—Messrs. S. M. Woodward and H. W. Griffiths.

Council.—Messrs. T. Thomson, N. Gold, O. V. Gunning, H. W. Steele Bodger, R. H. H. Over, F. Chambers, R. B. Palmer, C. F. Parsons, B. DeVine, and the officers of the Association.

Representatives on the Council of the N.V.M.A.—Messrs. H. W. Griffiths, H. Tudor Hughes, R. H. H. Over, B. DeVine and the Hon. Secretary.

The above recommendations were unanimously accepted, and the retiring officers were thanked for their services during the past year.

The Spring Meeting.—The Council further recommended (1) that the date and place of the Spring meeting, held during May, should be left to the new President and the Hon. Secretary, and that they be further empowered to choose a subject for discussion; (2) that an invitation to the Association to pay an official visit to the Equitation School at Weedon, on April 29th, be accepted with thanks; (3) that the kind offer of Sir Frederick Hobday to give an address at the summer meeting be accepted with thanks; and (4) that Professor Gamgee, in consideration of his interest in this Association and the veterinary profession generally, be elected an honorary Associate.

These recommendations, on the motion of Mr. Cormack, seconded by Mr. Martin, were also carried unanimously.

Delegates' Expenses.—Mr. DeVine, in accordance with notice duly given, moved that the Association pay the railway fare of the representatives of this Association when attending meetings of the National Veterinary Medical Association in London. He said that when he gave notice of this motion at the previous meeting, he had no idea that he would be elected as a representative. In point of fact, he was not affected in quite the same way as the general practitioner, who was not only required to pay his own travelling expenses, but lost a day's business as well. He (Mr. DeVine) did not suffer financially through leaving Birmingham for a day, and he was therefore not thinking of himself, but of his colleagues, who had this double burden to bear.

Mr. Chambers said he was in full agreement with the idea which prompted Mr. DeVine's motion, but he thought they ought to know what

the cost would be and whether the Association could afford it.

Mr. Brooke replied that it would cost the Association £20 a year at least, which, in the present state of their finances, was more than they could afford. He was in hearty sympathy with Mr. DeVine, but the only way to meet this extra payment was by increasing the annual subscription.

The Hon. Secretary spoke in similar terms, whereupon Mr. DeVine volunteered to withdraw his resolution, but an amendment, moved by Mr. Martin and seconded by Mr. Davison, was eventually carried, referring the matter to the Council, with instructions to devise ways and means, if possible, to carry out Mr. DeVine's suggestion, with which, in principle, the meeting agreed.

Paper.—Mr. A. K. Cameron, B.Sc., of Edinburgh, now read a paper on "Accidents and Injuries to the Racing Greyhound," which was heard with much interest and appreciation. On the conclusion of his paper Mr. Cameron exhibited a number of X-ray photographs illustrating some of the fractures and other injuries which he had described. [Mr. Cameron's paper, and a report of the discussion (greatly curtailed, for want of time) which followed its presentation, are reproduced at the commencement of this issue.—*Editor.*]

The Hon. Secretary, [illegible]ving a vote of thanks to Mr. Cameron, said they had all enjoyed his address on a subject of growing interest to the profession, and his only regret was that there was no time for its adequate discussion.

The vote of thanks, seconded by the President, was carried, and tea was then served before the company dispersed.

H. W. Dawes, *Hon. Secretary.*

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YORKSHIRE AND NORTH MIDLAND V.M. SOCIETIES*

JOINT SUMMER MEETING

A joint summer meeting of the North Midland and Yorkshire Divisions (on Wednesday, July 3rd) took the form of an excursion through Derbyshire, visiting Chatsworth, Haddon Hall and many of the celebrated beauty spots of Derbyshire. The whole party numbered about 40. The members of the two Associations and their friends met for lunch at the Grand Hotel, Sheffield, with Mr. A. H. Watson, the President of the Yorkshire Division, in the Chair. After luncheon, which was thoroughly enjoyed by everyone present, the party proceeded by motor coach to Chatsworth House where we were met by Mr. E. Marrison, the President of the North Midland Division, who had arranged for our visit to Chatsworth and Haddon Hall. The party was conducted through Chatsworth House and grounds and everything of interest was fully explained. The party then proceeded to Haddon Hall through which we were also conducted and very considerable interest was displayed by those present in the romantic history of this renowned spot. From Haddon Hall the party proceeded to Bakewell, where we were entertained to a very well enjoyed tea at the kind invitation of the two Presidents, Mr. E. Marrison and Mr. A. H. Watson. After tea a vote of thanks to the joint Presidents was proposed by Mr. T. C. Fletcher, seconded by Mr. Green, and suitably replied to, and the party set out on its return journey through the magnificent scenery of Derbyshire to Sheffield where it broke up, everyone being satisfied that we had had a most enjoyable day.

The following members of the two Divisions were present together with their ladies: *Yorkshire Division*—Messrs. A. H. Watson (President), Duncan, Gillespie, McGregor, McKinna, McKellar, Procter, Ritchie, Salusbury, Scott, Whitehead, and the Hon. Secretary; *North Midland Division*—Messrs. E. Marrison (President), Fletcher, Green, Hudson, Nixon, Thompson, and the Hon. Secretary.

Wm. Tweed, E. F. McCleery,
Hon. Secretaries.

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LORD LINLITHGOW AS VICEROY

Interest in Veterinary Services

Among the many reasons why members of the veterinary profession should regard Lord Linlithgow's advent as Viceroy of India as a splendid appointment, is the fact that he was Chairman of the Royal Commission on Agriculture in India, which, after two years of thorough investigation, in which the veterinary services were enquired into with very particular care—in reality, for the first time on such a scale—issued its report in 1929. The chapter dealing with veterinary work in India and the recommendations made are a model of careful enquiry and understanding, and in it is reflected Lord Linlithgow's personal interest, as a British nobleman with agricultural sympathies, in our work, as well as that of the members of his Commission, in particular of Sir Thomas Middleton, K.B.E., K.C.I.E.

At this momentous stage in the history of India, when there will fall to Lord Linlithgow, as Viceroy, a task for which, by his work as Chairman of the Royal Commission in Agriculture in India and Chairman of the Joint Select Committee of both Houses of Parliament, he has already proved himself outstandingly suitable—that of initiating the peoples of this subcontinent into the great measure of reform that has just been granted to them by Act of Parliament—we feel that not the least important of the national concerns in which he will take a lively interest will be the well-being and expansion of the veterinary services—services which mean to India, having in mind the stupendous losses she suffers from animal disease, perhaps more than they do to any other country in the world.

Animal Diseases Research Association

Dr. Russell Greig's Report to the Annual Meeting

The Annual Meeting of the Animal Diseases Research Association was held in the new library of the Moredun Institute on Wednesday, July 24th, and the urgent need for additional staff and extended accommodation at the Institute was strongly pressed.

Since its inception in 1922 the staff of the Animal Diseases Research Association have undertaken the investigation of such disease problems as lamb dysentery, braxy, louping-ill, lactation tetany, milk fever, lambing sickness and pine; have elucidated the nature of these; and have obtained and made known means for their specific prophylactic treatment. The causal organism of tick-borne fever has also been demonstrated. Besides some necessary continuation of work on these diseases, the programme of research now in active prosecution and in contemplation embraces such other major problems as grass sickness in horses, contagious bovine abortion, "white scour" in calves, enzoötic abortion in ewes, "scrapie," tick-borne fever, the enterotoxæmias of sheep, the ecological control of sheep tick, blow-fly myiasis, the magnesium metabolism of the dairy cow, and the various forms of deficiency "pine" in cattle and sheep.

Mr. F. L. Wallace, of Candacraig, the President of the Association, moved the following resolution:—

> "In view of the insistent demands by Scottish stock owners for immediate investigation of animal disease problems which cannot be adequately undertaken with the resources at present available, it is urgently necessary that the staff of research workers in the Moredun Institute should be strengthened and that additional laboratory accommodation and other equipment should be provided.
>
> "It is estimated that for these purposes capital expenditure of £12,000 and additional annual maintenance of from £2,500 to £3,000 will be required and the Association appeals strongly to the Department of Agriculture for Scotland and the other Government authorities concerned to make substantial grants in aid of this expenditure.
>
> "The Association further appeals to corporations and to private persons interested in agriculture or in public health for contributions to the funds needed to enable the Association more fully to undertake its responsibilities to the agricultural community."

He said that one had only to hear the reports of a great many stock owners in the country to realise in what degree the work of the Association was appreciated. Indeed, it was true that the Moredun Institute had now received general recognition as one of the leading veterinary research institutes in the world. A very large programme of work was being actively carried out, but there was a limit to what human beings could tackle and, before the Association could undertake more work, they must have increased staff, but they could not increase the staff, even if they had the money to provide their remuneration, because the present buildings were fully occupied.

The resolution was put to the meeting and carried unanimously.

The Director's Report

The Director of the Institute, Dr. J. Russell Greig, made the following report on the work for the last twelve months.

Tick-Borne Fever.—There is now very little, if any, doubt that the microscopic bodies which occur in the white cells of the blood and the spleen in tick-borne fever represent the actual causal parasites of the disease. A great deal of study has been applied to elucidating the nature of these organisms and prolonged and careful experiments have been carried out with a view to determining whether their life history in the blood is represented by a series of cyclic changes, but, so far, the true nature of the organism has remained obscure. This very fact has excited considerable interest in that the organism appears to possess certain peculiar characters, which do not permit its ready classification in one of the recognised groups of disease-producing parasites. It is therefore possible that the discovery of this parasite may eventually widen our knowledge of parasitic types.

We have previously shown that the sheep tick finds suitable hosts on many animals other than the sheep. It was important, therefore, to know whether, in the event of sheep stock being wholly removed from infected pastures, the causal agent of tick-borne fever could survive in ticks which had engorged on wild mammals or on birds. As the result of experiments designed to test this point, there has been obtained evidence that the infective agent of tick-borne fever can survive in ticks which feed on non-susceptible hosts, and it therefore follows that infected land cannot be immediately cleaned of the virus of tick-borne fever by removing the sheep stock.

Louping-Ill.—The work on louping-ill has been chiefly directed to improving the methods of preparation of preventive vaccines. We have, in the last few years, subjected louping-ill vaccines to extensive field trials and, while the field reports upon this year's issue are not yet complete, upon all the information now in our possession I believe I am justified in stating that louping-ill must now be added to the growing list of animal epizoötics which can be effectively prevented by specific means.

Further experience is required before the ultimate economic value of louping-ill vaccine can be accurately assessed. We are still without definite knowledge as to the period over which a single vaccination will confer immunity, and whether an effective passive immunity can be conferred upon the lamb by the vaccination of the ewe. There is already evidence that vaccinated rams may be introduced with safety into

severely affected areas. Further, it is now perfectly rational to believe that by immunising sheep over large areas, the ticks in such areas will be cleansed of infection, and the disease may, within a few years, be thus removed from the affected land.

The demands for louping-ill vaccine are already large and, in all probability, will be considerably increased.

The possibility that louping-ill can be transmitted to man has also received investigation. As a result of reports received from other laboratories, notably the Rockefeller Institute in New York (who had requested a strain of the Moredun virus), it appeared possible that human beings may contract illness as a result of their being brought into contact with louping-ill virus. The clinical evidence in support of this suggestion has been far from definite, but, as the result of a series of tests conducted on the members of the staff of the Institute, it was found that those individuals whose duties brought them into close contact with louping-ill virus possessed immune bodies in their blood serum, suggesting that they had actually received infection and that they had developed some degree of immunity. The whole evidence at present available would suggest that, although man may be susceptible to louping-ill infection, such infection, in the great majority of cases, is capable of producing only a slight degree of illness, to which immunity can be naturally developed.

Lamb Dysentery.—The demand for lamb dysentery serum still continues to be large and 68,000 doses were this year issued by the Institute.

Braxy.—It can be said that the method of braxy immunisation which we adopted in 1931-32 has now an established reputation as an effective preventive measure, but, since this involved a double inoculation of the hoggs, it was important to discover whether the method could be simplified by the production of an effective single-dose vaccine. Extensive field trials conducted over the last two years have proved that this is so and, while nearly 51,000 doses have this year been issued, it is expected that, as the result of the simplification of the technique, the demand for the product will, in the future, be still further increased.

In collaboration with the Braxy Committee of the Agricultural Research Council, we are also undertaking research upon the whole group of braxy-like diseases.

Grass Sickness.—This year, a programme of very intensive research has been conducted upon the subject of grass sickness in horses.

In order to test the significance, if any, of toxins of the *Welch* group which had been demonstrated in filtrates of the intestinal contents of certain acute cases of grass sickness, this year a field station has again been established in Angus, and an extensive examination of the intestinal contents of acute cases, with special reference to the presence of *Welch* toxins, has been carried through.

The whole investigation of this problem has been attended by very considerable difficulty, and I am only able to state that the results are as yet indefinite in character.

Contagious Bovine Abortion.—While it may be said that contagious bovine abortion can, under certain conditions, be controlled in a herd by methods of isolation, the circumstances which permit of the adoption of this method are comparatively seldom met with under the conditions of ordinary commercial dairying. It is therefore felt that the effective control of the disease will probably be accomplished by the development of a safe and effective preventive vaccine.

Live vaccines, while in many cases they appear capable of producing a very considerable degree of immunity, are attended by danger, and their continued use is a means of keeping alive infection in a herd. Our aim, therefore, is to produce a vaccine, deprived of life, but still capable of inducing an adequate degree of protection, and the scheme of research which we have undertaken in collaboration with the Scottish Committee on Contagious Bovine Abortion has as its object the development of such a vaccine.

As the result of a study of the disease as it affects small laboratory animals, the work has now reached a stage when the preventive value of dead vaccines, prepared by various methods, can be tested against standard preparations of the infecting microbe.

Enzoötic Abortion in Ewes.—Enquiries over a number of years have shown that abortion in ewes is the cause of really enormous losses in many parts of the country. In numerous instances, flockmasters have become accustomed to expecting that as many as 20 per cent. of their pregnant ewes will abort.

The disease is rather clearly defined in its incidence and the evidence suggests that, at least in many cases, it results from certain dietary deficiencies in the ewe.

We have been conducting extensive field experiments on this problem since 1931. This year 524 ewes have been employed in tests in which the ewes in the control groups numbered 1,501. So far, while much valuable data has been collected, the true nature of enzoötic abortion has not yet been determined. It is hoped, in the future, to carry out experiments and observations on an even more extended scale.

Scrapie.—That obscure disease, which has taken such toll of the flocks in Scotland and which is known as "scrapie," has held a prominent place in our research programme, and the systematic and exhaustive microscopic examination of the tissues of scrapie sheep, which was commenced in 1932, is being continued with special reference to the central nervous system.

Our knowledge of the conditions of occurrence of scrapie in the field has also been considerably extended.

So far, the experiment which was set up for the purpose of testing the possibility that the contagium of scrapie can be transmitted through the medium of the pastures has given no evidence that the disease is transmissible by this means.

Magnesium Metabolism.—As previously reported (1932), we were able to demonstrate that the condition in cows known as lactation tetany was constantly associated with an acute deficiency of magnesium in the blood. The existing knowledge of magnesium metabolism is, however, in a rudimentary state, and the Association has resolved to undertake research of a fundamental character upon the subject. This research, in which the Ministry of Agriculture's Institute at Weybridge has agreed to collaborate, has been inaugurated and is now in active prosecution.

White Scour in Calves.—In recent years this disease has caused very heavy losses to the dairying industry and, under the Scottish Board of Research in Veterinary Science, a programme of research has been planned; active work, in

which the Association will play its part, will be commenced in the autumn of this year.

Tick Deterrents.—Since the period of maximum tick activity is strictly limited, it is possible that, by practising a series of carefully spaced dippings of the stock on a farm, a method of practicable tick control might be achieved. A large number of experiments and observations have been carried out during the past two seasons. The results have been encouraging and it is proposed to repeat the experiments on the test farms during the course of the next few years.

A large number of tests have also been made with a view to assessing the comparative value of various chemical substances as tick repellents.

Blowfly.—The sheep maggot fly has constituted a veritable pest throughout the country during the last few years, and the Association are anxious to undertake the investigation of rational methods of control. Preliminary field observations have been carried out, but, because of unforeseen circumstances, this year's work has had to be considerably limited in its extent.

Pine.—In recent years there has accumulated evidence that that form of pine which occurs in Tiree exists in a less acute form on large areas on the mainland of Scotland, and the administration of iron compounds to cattle and sheep, notably in the northern counties of Scotland, has resulted in immediate and marked improvement in their physical condition.

With the assistance of the Edinburgh and East of Scotland College of Agriculture, we are also investigating that form of pine in sheep which occurs in certain parts of the Cheviot range. The results of this year's work are distinctly encouraging, and a scheme of research on a more extended scale has now been arranged.

Milk Fever.—Our finding that an acute calcium deficiency of the blood represents the immediate cause of milk fever in cows has now met, I believe, with general acceptance, and the method of calcium therapy which was devised by the Institute as a specific curative treatment in this disease has now been generally adopted throughout the world.

The *Scotsman*, in the course of a leading article in its issue of July 25th supporting the Association's appeal for funds, says: "This appeal is not a new one, and it should be answered as speedily as possible, in view of the valuable scientific work which the Institute has done and is doing. The reason why more funds are necessary can be briefly stated. The programme of research now under way and in contemplation cannot be undertaken in adequate measure by the present staff. Additional workers and equipment are necessary. For the extra staff extra accommodation is required. Plans have already been considered for the erection of additional buildings, and the total capital expenditure necessary is believed to be in the neighbourhood of £12,000. It is a small price to pay for the steady tracking down and perhaps eventual elimination of these animal diseases, some of them highly obscure, which yearly do so much damage to the agricultural industry.... In spite of its small size, the Moredun Institute has done work whose value is gratefully acknowledged by research workers in animal diseases all the world over. It is an Institute of which we in Scotland may be proud. The Agricultural Research Council, discussing its record, agreed that money spent on increasing the facilities for work at Moredun would be money well spent. That is a verdict which all who know will endorse."

Notes and News

The Editor will be glad to receive items of professional interest for inclusion in these columns.

Diary of Events

Aug. 22nd.—Summer Meeting of the Mid-West Division, N.V.M.A., at Stroud.

Aug. 24th.—Last date for entries for Jubilee Memorial Prize Examination.

Aug. 26th.—Meeting of the Editorial Committee, N.V.M.A., at 2, Verulam Buildings, Gray's Inn, W.C.1, at 4 p.m.

Sept. 24th to 25th.—Jubilee Memorial Prize Examination.

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Belfast Congress Number

In our next issue our readers will be given a full account of the proceedings at the outstandingly successful Congress held by the National Veterinary Medical Association at Belfast from July 29th to August 2nd, with the exception of Nos. 3 to 6 of the papers presented, and discussions thereupon. Members or subscribers requiring additional copies of the special Congress Number (price 1s., post free), which will constitute an interesting and informative record of a memorable Conference, are requested to make early application to the Editorial Representative, N.V.M.A., 2, Verulam Buildings, Gray's Inn, W.C.1.

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PERSONAL

Appointments.—Birkenhead Health Committee has selected Mr. Neville Morrison Clayton, M.R.C.V.S., Gateshead, for appointment as the town's Veterinary Surgeon, in succession to Mr. Harold Burrow, who is leaving to become Chief Veterinary Officer to Derbyshire County Council. Mr. Clayton will also be appointed Inspector under the Diseases of Animals Acts.

Mr. A. W. Gledhill, M.R.C.V.S., is appointed by the Colonial Office as Veterinary Officer, Uganda.

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R.C.V.S. OBITUARY

Argyle, Edward Percy, D.S.O., Lieut.-Colonel R.A.V.C. (retd.). Graduated London, July 16th, 1901; died July 26th, 1935. (Croix de Guerre and D.S.O.)

In connection with the death of Lieut.-Colonel Argyle, which we record with much regret, Major Glyn Lloyd, R.A.V.C., Barrister-at-Law, writes:—

"The sudden death of Lieut.-Colonel Edward Percy Argyle, D.S.O., at St. Paul's Hospital, London, will be sadly mourned by the officers of the Royal Army Veterinary Corps and his many friends in other branches of the Army.

"He was the eldest son of the late Edward Argyle, solicitor, of Tamworth, and was born in 1875. He received his early education at King Edward's School, Birmingham, and afterwards attended the Royal Veterinary College, London, where he qualified as a veterinary surgeon in 1901. Immediately after qualifying he went out to the South African War as a civilian veterinary surgeon, and received the Queen's medal with clasps. After the cessation of hostilities he obtained a regular commission in the Army Veterinary Corps.

"During the Great War, after serving in France for the first nine months of the War, he was posted to Egypt, and served in Gallipoli in 1915. Afterwards he held important administrative appointments, including A.D.V.S., Army Headquarters, Egyptian Expeditionary Force, and O.D.V.S., Desert Mounted Corps, in the latter capacity taking part in Allenby's advance in Palestine. He was mentioned four times in dispatches, and was awarded the D.S.O. and the Croix de Guerre in 1917. In 1919 he was promoted Brevet Lieut.-Colonel.

"After the War he proceeded to India and held administrative appointments in the Southern Command. On his return to England he was appointed Commandant of the Royal Army Veterinary School, a post he held until he went on retired pay in 1930.

"It was in the years of his retirement that he found time to devote himself to the problems that had exercised his mind during his Army service. He worked unremittingly in investigating nerve lesions in the horse. He published a preliminary survey of his work in the *Journal of the Royal Army Veterinary Corps*, and the importance and quality of his work were gratefully acknowledged in the annual report of the Royal College of Surgeons. He was hoping to publish further results of his researches which will shed great light on the changes which occur in the central nervous system consequent on lesions of the peripheral nerves.

"A brilliant conversationalist and raconteur with a nimble wit, he was a great favourite in any gathering of friends. As a writer he possessed a racy and pleasing style. He was a man of magnetic personal charm, with a gentle courtesy and kindness of heart, qualities which attracted a host of friends from all walks of life who now mourn the passing of a very lovable character."

. . . . .

The Late Mr. F. J. Hood, M.R.C.V.S.

An Appreciation

The death of Frederick James Hood,* Veterinary Officer, on July 23rd at Edinburgh after a short illness removes from the Tanganyika Service one of its most efficient officers.

Born in October, 1893, at West Auckland, Co. Durham, he received his education at George Heriot's School, Edinburgh, from which he passed into the Royal (Dick) Veterinary College, Edinburgh, and qualified as M.R.C.V.S. in July, 1921.

His professional studies were interrupted by the war from 1915 to 1919 during which period he served in the R.A.V.C.

Mr. Hood was appointed a Veterinary Officer in Tanganyika Territory in December, 1922, which position he filled with conspicuous ability up to the time of his death. In 1928 he took a post graduate course at the Liverpool School of Tropical Medicine.

During his service Mr. Hood was appointed Acting Deputy Director of Veterinary Services from February to August, 1929, and during his last tour in the Territory he held the post of Acting Senior Veterinary Officer, Central and Iringa Provinces.

The whole of Mr. Hood's service was characterised by thoroughness and enthusiasm. Apart from his strictly professional duties in connection with the control of such diseases as rinderpest, bovine pleuro-pneumonia and East Coast fever, Mr. Hood was actively engaged in fostering the economic side of animal industry and it was largely due to his initiative and perseverance that the development of the hides and skins industry and the production of clarified butter throughout the native areas of the Territory, but particularly in the Central Province, have reached the present high standards.

Mr. Hood's premature decease has left a vacancy which it will be very difficult to fill, and the Department to which he belonged has lost a man whose kindness, courage and readiness to help have endeared him to all who knew him. He was a man with whom one has been proud to have been associated and who adorned the profession to which he belonged.

H. J. L.

* Reported in our issue of August 3rd.—*Editor.*

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DEATH OF LORD WOOLAVINGTON

The profession will have learned with much regret of the death of Lord Woolavington, one of the wealthiest and most important supporters of the Turf, who on several occasions gave practical evidence of his interest, not only in the blood stock which made his name as an owner a household word in racing circles, but in the veterinary profession, amongst the members of which he numbered many close friends. Indeed, it was the friendship of over half a century existing between him and the then President of the Central Division, N.V.M.A., (Professor Macqueen) which resulted in the visit of that Society to Lavington Park in 1929, which is still remembered as an outstandingly successful summer meeting. It may now be recalled how, after the viewing of the famous Westerlands and Lavington studs, the Professor took the opportunity of reminding the company that Lord Woolavington was a close friend and warm supporter of the late Principal McCall, and that he had continued his support of the Glasgow Veterinary College that day. Moreover, Lord Woolavington had been a generous contributor to the Royal Veterinary College, Camden Town, and his love of animals was further shown when, in 1926, he gave £10,000 to Edinburgh University for the endowment of the Animal Breeding and Research Department.

Much success came to Lord Woolavington as an owner—he won the Derby twice and many other classic races—and also as a breeder. Indeed, at Lavington Park, his Sussex seat, he undoubtedly possessed one of the finest breeding establishments in the country.

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THE WORCESTER APPOINTMENT: N.V.M.A. REPRESENTATIONS SUCCEED

Members of the Association will have been gratified to note from the announcement appearing in our last issue that, in consequence of the representations made by the deputation ap-

pointed by the N.V.M.A. to place the views of the "National" on the question of salaries for whole-time appointments before representatives of the Worcestershire County Council, and of refusal to publish in the Association's journal that Council's advertisement for a County Veterinary Officer at the salary originally offered, the salary was increased to conform to the Association's scale.

That this commendable step was not taken by the Council without some opposition is evident from the report of the proceedings of the meetings at which the decision to re-advertise the post at the higher salary was arrived at, but we are confident that, in re-considering the matter as they have done, the County Council have acted in the best interests of the important agricultural community they serve.

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VETERINARY SERVICES IN HEREFORDSHIRE

Veterinary services were the principal subject of discussion at a recently-held special meeting of the Herefordshire Diseases of Animals Committee, when consideration was given to the position arising through the resignation of the Assistant Veterinary Officer (Mr. J. A. McKinnon), who has been appointed Assistant Veterinary Officer to the West Sussex County Council. The Clerk said his new salary would be £400, the same as he received in Herefordshire, but that it would rise by four increments to £600, whereas there was no undertaking as to increments in Herefordshire.

Mr. Hopkins contended that Mr. McKinnon's successor should be appointed on scale. They had been fighting against the veterinary organisation all along, and it was time for Herefordshire to fall in line with other counties. This continual fighting against the various officers' organisations on the question of salaries could only result in the end in their having no "bright young men" when the older officials left them one by one.

Alderman Powell supported this view, and said they were not going to get an assistant veterinary officer to remain at £400 a year.

The Clerk said he was unable to advertise, except for a man at £400 a year, without undertaking as to increments, unless it went to the Establishment Committee for approval.

Eventually it was decided, on the motion of Alderman Powell, seconded by Mr. Hopkins, to recommend to the Establishment Committee that the post be advertised at a salary of £400, rising by annual increments of £25 to £500.

In regard to a letter from the Ministry asking whether the committee would enforce a proposed Order regarding warble-fly (which the Ministry considered would have to be applicable to the whole of Great Britain to be effective), it was agreed, on the motion of Mr. Hewitt, seconded by Mr. Lane, to reply that the committee were so prepared provided that in their opinion the regulations with regard to imported cattle were proper and effective.

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PROPOSED HORSE BAN

Protests from Many Quarters

Mr. Hore-Belisha's proposal to ban horse-drawn traffic from the streets of large towns is attacked by the National Farmers' Union. "So far as the Union is aware," states a manifesto issued by the N.F.U., "the Minister of Transport has taken the decision without previously consulting any representative body connected with agriculture, and on the face of it, in complete disregard of agricultural interests.

"Mr. Hore-Belisha has already defined his policy in the matter of horse-drawn traffic in a manner which has occasioned keen resentment in farming circles.

"His unwarrantable interference with the interests of a legitimate industry has been warmly condemned in the agricultural Press and will be opposed by the Union at every opportunity.

"The Union hopes that users of horse transport will decline to be intimidated by the Minister of Transport."

A strong attack on the Minister's policy was made at a meeting of the Tamworth Branch of the N.F.U. Mr. Robert Garland, a Staffordshire delegate to the Union headquarters, said that the horse trade was improving, but the Minister of Transport's suggestion would be a serious blow to it.

Horse Association's Protest

A vigorous letter of protest has been addressed to the Minister by the National Horse Association. The letter states that the proposals would spell disaster for the many tenant farmers who are largely dependent on livestock breeding, in which the breeding of horses of every type plays an important part.

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RESEARCH FELLOWSHIPS IN TUBERCULOSIS

The name of Geoffrey Bernard Brook, D.Sc. (Edin.), M.R.C.V.S., Senior Assistant Veterinary Officer, Derbyshire County Council, appears among the list of those receiving awards of Dorothy Temple Cross Fellowships for the academic year 1935-36, made by the Medical Research Council under the terms of the benefaction in that name for research fellowships in tuberculosis.

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ARMY VETERINARY SERVICE

Movements of Officers

The following officers are at present in this country on leave: Major G. F. Watkins and Captain A. A. Kidd, *ex* India; Major R. M. Bamford, O.B.E., and Major R. H. Knowles, *ex* Egypt, pending reversion to the Home establishment.

Major Knowles joins for duty at Camberley on September 12th, and Major Bamford at Larkill on October 10th.

Correspondence

Letters to the Editor should reach the Office not later than by the first post on Tuesday morning for insertion in following Saturday's issue.

All correspondence must bear the name and address of the contributor for publication.

The Editor does not hold himself responsible for the opinions of his correspondents.

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THE THREAT TO THE HORSE

To the Editor of the Veterinary Record

Sir,—May I seek the hospitality of your columns for a few observations on the above very momentous and vital question. Speaking with an experience of nearly 30 years of London traffic and London transport, I would warn the public not to be misled by the noise and bluster of mechanical and other selfish interests. If the horse has got to go, let the decision be taken

on what is best in the country's interest: sentiment and expediency can and must be ignored. What the public wants and what the nation wants is the best and cheapest form of transport, and so long as the horse shows economic advantages in these affairs, so long must he remain.

It will not be denied that horse-drawn vehicles as well as many other forms of traffic do, at times, slow up the faster moving vehicles, but many of us think that this is a good thing, and a very useful check on that "speeding-up" which has become a real source of anxiety and danger to the public. Moreover, is this speeding-up—of which we hear so much—so vital to the interests of the nation as to give it a prior claim to all other interests ? Of course not: no one section of the community has a right to expect privileges at the expense of others. The coster's barrow should be as free to our highways as the millionaire's Rolls-Royce.

We should all welcome some relief from the congestion which now exists on many of our main thoroughfares, but the banning of the horse will not solve this difficulty, and I venture to think that it would be a national calamity and a great national loss if selfish interests were to be allowed to dominate our streets and highways to the exclusion of our faithful friend the horse. One of the effects of the adoption of Mr. Hore-Belisha's proposal would be to raise the cost of transport, while by the displacement of large numbers of those who are entirely dependent upon horse-transport for their livelihood, it would inevitably result in a serious increase in the vast figure of totally unemployed, which doubtless causes as much sympathetic concern to the Minister of Transport as it does to the rest of us. Moreover, there are approximately 200,000 industrial horses in Great Britain, of which probably one-half are engaged in the work of transport, representing a capital value of between four and five million pounds: it must be remembered also that the prosperity of many interests, notably those concerned with forage, is bound up with the use of the horse. The great horse-breeding industry, too, appears at long last to be on the up-grade. Is this the time to deal it so drastic a blow?

Essentially, however, those who desire to see the retention of the horse base their case on the principle that, subject to certain rules and regulations which must be observed by all, our streets and highways must remain free and unrestricted if the best interests of the nation are to be served.

May I, in conclusion, express the earnest hope that our parent body, the "National," will move in this matter forthwith—as it is evident from the recent pronouncements of the Minister that no time is to be lost if there is to be prevented the taking, in the specious name of progress, of a step which is at once dangerous, uneconomic and unjust.

I am, Sir,
Faithfully yours,
J. W. McIntosh.

Dollis Hill Farm,
Cricklewood, N.W.2.
August 11th, 1935.

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BOVINE TUBERCULOSIS ERADICATION ALLOWANCES

To the Editor of the Veterinary Record

Sir,—You have a "contradictory optimist" as a leader writer in to-day's *Veterinary Record*. I refer to the article on page 939, "Bovine Tuberculosis Eradication Allowances." He is contradictory because he refers to "the difficulty presented to a herd owner when the number of reactors at an *initial* tuberculin test is found to be *more* than 10 per cent. The Ministry now proposes to give to *such an owner* £1 1s. per annum and 2s. 6d. per head, provided the whole herd is tested, up to the maximum of four times where the *incidence* of tuberculosis *prior to the initial test* does NOT exceed 10 per cent." How does that remedy the difficulty of the man who *has* more than 10 per cent. reactors at the *initial* test?

He is optimistic, if, as he asserts, he really thinks that this financial help is going to do anything to reduce the incidence of tuberculosis in the country. I practise in a dairy county and perhaps a few figures will be enlightening.

I have, in addition to ordinary practice, 272 herds to examine twice a year. Only two herds exceed 60; five have 30; and 24 from 15 to 20 cows. The *average* number is nine, not 20. They are commercial herds, therefore very little extra stock is carried. This, I take it, is what one will find, on analysis, all over the country.

Now, taking an average of nine: what is 10 per cent. of nine? It is *less* than one cow per herd, therefore the owner will not benefit by the £1 1s. and 2s. 6d. per head which I suppose is "per annum." Four tests have to be made for—again taking nine cows—£2 2s. 6d. from Government funds. The herd has to be tested initially and up to four times afterwards, that is five tests in all, supposing the initial test is 10 per cent.

Will a practitioner test the herd at 6s. per head? If he does he gets £2 14s. a time, or £13 10s. for five tests (always supposing that five tests will be necessary) leaving £11 7s. 6d. for the owner to pay. Is a man with nine cows going to pay this?

Or take it at the figures mentioned in the article—20 cows. Leaving out the initial tests the owner gets £3 11s. from the Government grant for four tests which cost him at 6s. per head £24, leaving a debit of £20 9s.

A short time ago, I tested a herd of ten cows in an endeavour to get milk from tubercle-free cows for children's use. Eight of these went down on the test. If the owner had sold these cows out of the herd and bought in eight other tuberculosis-free cows, what would have been his total loss? Another test on 36 young pedigree cattle, none of them three years old, showed ten reactors or 27·7 per cent. Rather a big percentage for the age.

Or looking at it from another point of view, it is generally conceded that 40 per cent. of the cows in England and Wales would react to the tuberculin test. How many tests would have to be made to get the incidence down to 10 per cent. What would be the cost of testing and replacement, plus four tests to qualify for the £1 3s. 6d. per annum?

How, too, can it be made out that the practitioner will benefit, especially from a commercial herd. His work will not be very strenuous, I'm afraid, and the Ministry's grant of £750,000 will last a long time.

This letter is not an assertion, nor is it destructive criticism—it is intended to draw an explanation as to what benefit will accrue to either the owner of a dairy herd, the general practitioner or to the country at large by the reduction of the incidence of tuberculosis.

If my reasoning is correct, why try to bolster up a moribund Order?

I have the honour to be, Sir,
Your obedient Servant,
J. W. Hall Masheter.

Ruddle House,
Newnham-on-Severn,
Gloucestershire.
August 10th, 1935.

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HUSK IN ADULT CATTLE

To the Editor of the Veterinary Record

Sir,—Seeing Dr. McCunn's letter in *The Veterinary Record* on the above subject, I may say that it is not a new thing for adult cattle to be affected with husk. In my first year in practice, over 30 years ago, I had three farms in which were milking cows and three-year-old bullocks, as were then kept, very badly affected, and on looking up records I find that out of 12 cows four died on one farm. The peculiar thing was that the calves were all right on each of the farms. I made *post-mortem* examinations and found the parasites (the names of which, I may say in passing, as have those of all other parasites since my college days, changed beyond my ken).

In this district it is rarely that we have a season in which we do not inject heifers in calf and often cows, and recently I have been wondering if the good effect of medicine by mouth in husk is altogether due to clearing of the parasites from the bowels, and is there no possible chance for some forms of the *Strongylus micrurus* during its stages of life to be present in the bowels? I ask this as I have seen a wonderful effect, after injecting two or three times with no result, follow from giving lysol, turpentine and oil by mouth on an empty stomach. Moreover, why do some farms get this trouble every year and other farms close by, with similar land, etc., only occasionally? This latter fact applies also to red-water in cattle in this district. In 1934. I attended red-water on about a dozen farms where there had never been a case for 20 years or more.

G. J. Roberts, F.R.C.V.S.

Pwllheli.

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History of the Veterinary Profession in South Africa: C.V.S.s and Second Anglo-Boer War (1899-1902).

To the Editor of the Veterinary Record

Sir,—In endeavouring to trace in the *Register* the names of C.V.S.s (attached A.V.D.) given by Smith, F. (*History of the R.A.V.C.*, p. 259) as having served in South Africa, I find that through discrepancies, chiefly in initials, it is not possible to identify the following:—

Brownrigg, R.	Layshon, H.
Beattie, R. S.	McGrath, J. J.
Brown, J. B.	Newcombe, H. H.
Byrne, ?	Reece, R. S.
Barber, K.	Scott, W.
Cameron, G. T.	Thompson, J.
Douglas, J.	Vans-Agnew, E.
Dyson, E. M.	White, W. T.
Gardner, G.	Wilson, E. A.
Kendall, W. A.	Young, J. C.

In other words, the names and initials given by Smith do not correspond with the names in the Register. If anyone can assist by giving the correct information along with college and date of qualification, I shall be grateful.

Yours faithfully,
H. H. Curson.

South African Veterinary Medical Association.
P.O. Onderstepoort,
Pretoria.
July 17th, 1935.

Diseases of Animals Acts

SUMMARY OF RETURNS

Period.	Anthrax.		Foot-and-Mouth Disease.		Parasitic§ Mange.		Sheep Scab.	Swine Fever.	
	Outbreaks confirmed.	Animals attacked.	Outbreaks confirmed.	Animals slaughtered as diseased or exposed to infection.	Outbreaks reported by the Local Authorities.	Animals attacked.	Outbreaks confirmed.	Outbreaks confirmed.	Swine slaughtered.
	No.	No.	No.	No.	No.	No.	No.	No.	No.
Period 16th to 31st July, 1935	6	9	—	—	1	1	8	95	63
Corresponding period in									
1934	8	16	—	—	1	1	6	84	70
1933	10	10	—	—	2	3	4	54	42
1932	3	3	—	—	6	7	3	40	25
Total 1st January to 31st July, 1935	225	260	34	10,208	78	163	206	1,181	679
Corresponding period in									
1934	232	255	2	93	92	153	352	974	617
1933	173	194	56	5,350	102	178	212	938	561
1932	237	292	3	358	89	149	136	1,141	554

Note.—The figures for the current year are approximate only. § Excluding outbreaks in Army Horses.